



AD-A206 181
- AEFA -

LOSS OF TAIL ROTOR EFFECTIVENESS EVALUATION OF THE OH-58C HELICOPTER WITH DIRECTIONAL SAS

Frederick W. Stellar
MAJ, AV
Project Officer/Pilot

James D. Brown
MAJ, AV
Project Pilot

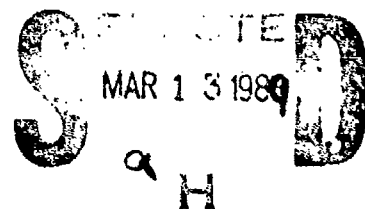
Michael K. Herbst
Project Engineer

Christopher P. Butler
Project Engineer

Timothy Hathorn
Project Engineer

August 1988

Final Report



Approved for public release, distribution unlimited.

AVIATION ENGINEERING FLIGHT ACTIVITY
Edwards Air Force Base, California 93523-5000

DISCLAIMER NOTICE

The findings of this report are not to be construed as an official Department of the Army position unless so designated by other authorized documents.

DISPOSITION INSTRUCTIONS

Destroy this report when it is no longer needed. Do not return it to the originator.

TRADE NAMES

The use of trade names in this report does not constitute an official endorsement or approval of the use of the commercial hardware and software.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED			1b. RESTRICTIVE MARKINGS		
2a. SECURITY CLASSIFICATION AUTHORITY U.S. ARMY AVIATION SYSTEMS COMMAND			3. DISTRIBUTION/AVAILABILITY OF REPORT		
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE					
4. PERFORMING ORGANIZATION REPORT NUMBER(S) AEFA PROJECT NO. 86-22			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
6a. NAME OF PERFORMING ORGANIZATION U.S. ARMY AVIATION ENGINEERING FLIGHT ACTIVITY		6b. OFFICE SYMBOL (If applicable)		7a. NAME OF MONITORING ORGANIZATION	
6c. ADDRESS (City, State, and ZIP Code) EDWARDS AIR FORCE BASE, CALIFORNIA 93523-5000			7b. ADDRESS (City, State, and ZIP Code)		
8a. NAME OF FUNDING/SPONSORING ORGANIZATION U.S. ARMY AVIATION SYSTEMS COMMAND		8b. OFFICE SYMBOL (If applicable)		9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8c. ADDRESS (City, State, and ZIP Code) 4300 GOODFELLOW BLVD. ST. LOUIS, MO 63120-1798			10. SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO. EJ7Y5440-02	PROJECT NO. -EJ	TASK NO. WORK UNIT ACCESSION NO.
11. TITLE (Include Security Classification) LOSS OF TAIL ROTOR EFFECTIVENESS EVALUATION OF THE OH-58C HELICOPTER WITH DIRECTIONAL SAS, UNCLASSIFIED					
12. PERSONAL AUTHOR(S) MAJ Frederick W. Stellar, MAJ James D. Brown, Michael K. Herbst, Christopher P. Butler, Timothy Hathorn					
13a. TYPE OF REPORT FINAL		13b. TIME COVERED FROM 23/06/87 TO 25/09/87		14. DATE OF REPORT (Year, Month, Day) AUGUST 1988	
				15. PAGE COUNT 302	
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	Directional Stability Augmentation System (SAS), Loss of Tail Rotor Effectiveness (LTE) Evaluation		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) The U.S. Army Aviation Engineering Flight Activity conducted a loss of tail rotor effectiveness (LTE) evaluation of the JOH-58C from 23 June through 25 September 1987. The JOH-58C configuration includes a directional stability augmentation system (SAS) manufactured by the SFENA Corporation, the larger-diameter tail rotor, and the improved engine fuel control. Handling qualities were evaluated at Edwards AFB, California (elevation 2302 feet). Twenty-eight flights were conducted for a total of 26.7 productive flight test hours. Primary emphasis of the evaluation was to evaluate the handling qualities of the JOH-58C in comparison to the standard OH-58C. The limited authority SAS (7% of full control travel) will not significantly reduce the conditions conducive to LTE. The overall handling qualities of the JOH-58C were moderately improved compared to the standard OH-58C. The concept of a SAS which damps uncommanded yaw rates demonstrated potential for reducing conditions conducive to LTE. However, the limited authority SAS saturated at small yaw rates (6 deg/sec) and did not significantly reduce the characteristic high yaw rates and moderate yaw attitude excursions observed in the JOH-58C. The JOH-58C exhibited moderate pitch, roll, and yaw excursions at 15 to 25 KTAS in azimuths from 240 degrees clockwise to 280 degrees. This characteristic was a shortcoming, upgraded from a deficiency for the standard OH-58C. Five additional shortcomings, of which four were previously identified in the standard OH-58C, were noted. (SICL)					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED		
22a. NAME OF RESPONSIBLE INDIVIDUAL SHEILA R. LEWIS			22b. TELEPHONE (Include Area Code) (805) 277-2115		22c. OFFICE SYMBOL SAVTE-PR

TABLE OF CONTENTS

	Page
INTRODUCTION	
Background	1
Test Objectives	1
Description	1
Test Scope	1
Test Methodology	2
RESULTS AND DISCUSSION	
General	4
Handling Qualities	4
Control System Characteristics	4
Static Lateral-Directional Stability	5
Maneuvering Stability	5
Dynamic Stability	5
Short Term (Gust Response)	5
Long Term	6
Controllability	7
Low-Speed Flight Characteristics	7
General	7
Region A	8
Region B	8
Region C	12
All Regions with SAS OFF	13
Trim Changes with Power Effects	13
Mission Maneuvering Characteristics	13
Directional SAS Effects	14
Miscellaneous	14
Cockpit Evaluation	14
Aircraft Pilot-Static System Calibration	15
CONCLUSIONS	
General	16
Shortcomings	16
Specification Compliance	16
RECOMMENDATIONS	17

17 Mission For

GRAAI

DTIC TAB
Unannounced
Justification

By
Distribution/
Availability

Aviation
Dist Special



APPENDIXES

A. References	18
B. Aircraft Description	19
C. Instrumentation	28
D. Test Techniques and Data Analysis Methods	31
E. Test Data	36

DISTRIBUTION

INTRODUCTION

BACKGROUND

1. Loss of tail rotor effectiveness (LTE) has been a problem with the OH-58 series aircraft and has been identified as a contributing factor in many accidents. In an effort to understand LTE, the U.S. Army evaluated the Bell Helicopter Textron Incorporated (BHTI) model 206 helicopter with a ring-fin configuration (ref 1, app A), the OH-58C helicopter with a 3-axis Stability Control Augmentation System (SCAS) (ref 2), and the JOH-58C with the SFENA 3-axis SCAS and larger tail rotor (ref 3). Army efforts were directed toward a comparative evaluation of the OH-58C with a ring-fin configured tail rotor and with a single-axis directional stability augmentation system (SAS). The OH-58C ring-fin program was terminated prior to completion and the comparative evaluation was canceled. The U.S. Army Aviation Engineering Flight Activity (AEFA) was tasked by the U.S. Army Aviation Systems Command (AVSCOM) to conduct a test program to evaluate the OH-58C helicopter with single-axis directional SAS (ref 4). A test plan (ref 5) was submitted and approved.

TEST OBJECTIVES

2. The objectives of this test were to evaluate the capability of a directional SAS to minimize the occurrence of conditions conducive to encountering LTE and determine the handling qualities of the OH-58C with a directional SAS, increased diameter tail rotor, and engine droop kit installed.

DESCRIPTION

3. The JOH-58C test helicopter, U.S. Army S/N 70-15349, was a modified OH-58C configured with a limited authority (7% of full control travel) directional SAS, manufactured by SFENA Corporation. The OH-58C, manufactured by BHTI, has a single, two-bladed, semirigid, teetering main rotor and a single, two-bladed, delta-hinged, semirigid, teetering tail rotor. Maximum gross weight is 3200 pounds. The aircraft is powered by an Allison T63-A-720 engine with an uninstalled intermediate power rating (30 minutes) of 420 shaft horsepower (shp) at standard sea level conditions, derated to 317 shp (main transmission limit). A detailed description of the standard OH-58C is contained in the operator's manual (ref 6, app A). The test helicopter incorporated the larger tail rotor (65 in. diameter) and the OH-58C engine droop kit product improvement. The helicopter was modified with a SFENA limited authority directional SAS and a hydraulically boosted tail rotor. The SFENA directional SAS is described in appendix B.

TEST SCOPE

4. The LTE evaluation was conducted at Edwards AFB, California (elevation 2302 ft). Twenty-eight flights were conducted for a total of 26.7 productive flight test hours between 23 June and 25 September 1987. Testing was accomplished within the constraints of the airworthiness release (ref 7, app A) and the operator's manual (ref 6).

Handling qualities were evaluated using MIL-H-8501A (ref 8) as a guide. Test conditions are presented in table 1.

TEST METHODOLOGY

5. Flight test data were recorded on magnetic tape using an onboard instrumentation package. A description of test instrumentation is presented in appendix C. Established flight test techniques (ref 9, app A) were used to determine the basic handling qualities of the JOH-58C with directional SAS ON and OFF. Test techniques and data analysis methods are briefly discussed in appendix D. Additional tests were designed to evaluate the capability of the directional SAS to minimize the occurrence of conditions conducive to LTE. The conditions which are conducive to LTE are discussed in the OH-58C operator's manual (ref 6). These include: (a) weathercocking, combined with the inherent yaw characteristic of the aircraft, which results in increasing yaw rates; (b) tail rotor vortex ring state which results in pitch, roll, and yaw excursions; and (c) main rotor disc vortex interference with the tail rotor which results in sudden right yaw rate. These conditions are significantly influenced by aircraft gross weight and density altitude (power margin), low speed flight, and transient rotor speed droop. A Handling Qualities Rating Scale (HQRS) (fig. D-1) and a Vibration Rating Scale (VRS) (fig. D-2) were used to augment pilot comments.

Table 1. Test Conditions¹

Test	Average Gross Weight (lb)	Average Density Altitude (ft)	Trim Airspeed (kt)	Remarks
Static Lateral-Directional Stability	2890	6110	96, 63 KCAS ²	Level Flight
			64 KCAS	MRP ³ Climb
			62 KCAS	Autorotation
Maneuvering Stability	2960	6650	64 KCAS	Left and Right Turns
Dynamic Stability	2930	5900	100, 64 KCAS	Level Flight
	2970	3850	0, 10, 20, and 30 KTAS ⁴	Left and right directional pulses at 90, 120, 150, 180, 210, 240 and 270 relative wind azimuth
Controllability	2910	3120	0, 10, 15 and 20 KTAS	Directional step inputs at 90 and 270 relative azimuth
Low Speed Flight	2990	3750	7 to 32 KTAS	Steady heading at relative wind azimuths of 045, 090, 120, 150, 180, 210, 225, 240, 270, 280, 290, 300, 310, 320, 330, 340, 350, and 360. Azimuths 120, 180, and 240 repeated with pilot and copilot doors removed.
	2700	3990	6 to 30 KTAS	Left/right yaw rates of 10 and 20 deg/sec established at 120/240 deg azimuth. Directional control fixed in the weathercock region (120 to 240 deg azimuth)
Trim Changes with Power	3080	7910	31, 40 and 51 KCAS	SAS OFF only Sideslip increments of 10 deg to ± 30 deg. Power changes from 93% to 10% engine torque.
Mission Maneuvers	2850	3020	0 to 100 KCAS	Hover, hover turns, quickstops, takeoffs to hover, landings from hover, slope landings and nap-of-the-earth flight. Performed in moderate to high winds.

NOTES:

¹Tests conducted at mid longitudinal and lateral center of gravity, with SAS both ON and OFF, pilot and copilot doors installed, 100% main rotor speed (354 revolutions per minute) unless otherwise noted.

²KCAS: Knots calibrated airspeed.

³MRP: Maximum rated power.

⁴KTAS: Knots true airspeed.

RESULTS AND DISCUSSION

GENERAL

6. A loss of tail rotor effectiveness evaluation of the JOH-58C was conducted at Edwards AFB (elevation 2302 feet) at the test conditions listed in table 1. Primary emphasis of the test was to evaluate the handling qualities of the JOH-58C in comparison to the standard OH-58C. The limited authority (7% of full control travel) SAS will not significantly reduce the conditions conducive to encountering LTE. The overall handling qualities of the JOH-58C were moderately improved as compared to the standard OH-58C. Prior testing of the JOH-58C with a 3-axis SCAS installed revealed flying qualities of the JOH-58C were significantly improved in comparison to the standard OH-58C (ref 3, app A). The concept of a SAS which damps uncommanded yaw rates demonstrated potential for reducing the conditions conducive to LTE. However, the limited authority directional SAS saturated at small yaw rates (6 deg/sec) and did not significantly reduce the characteristic high yaw rates and moderate yaw attitude excursions observed in the JOH-58C. As a result, the test was terminated prior to completion of all scheduled tests. The JOH-58C helicopter exhibited moderate pitch, roll, and yaw excursions at 15 to 25 KTAS in azimuths from 240 degrees clockwise to 280 degrees. This characteristic was a shortcoming, upgraded from a deficiency for the standard OH-58 (ref 10). Five additional shortcomings, four of which were previously identified, were noted.

HANDLING QUALITIES

Control System Characteristics

7. The mechanical characteristics of the JOH-58C hydraulically boosted flight control system were measured on the ground with the rotors and engine stopped and were qualitatively verified in flight. Hydraulic and electrical power were provided by external sources. All adjustable control friction devices were set to minimum friction. The SAS was ON but had no effect on control system characteristics. Force trim was ON and collective was full down.

8. The limits of longitudinal and lateral cyclic control travel are presented in figure E-1. The variation of control position with applied control force for the longitudinal and lateral controls is presented in figures E-2 and E-3. The longitudinal and lateral cyclic control force gradients were positive and essentially linear with no discontinuities. Breakout forces, including friction, were similar to those of the standard OH-58C helicopter. Longitudinal centering characteristics were positive but not absolute, resulting in a 0.8-inch longitudinal trim control displacement band. Lateral centering characteristics were positive but not absolute, resulting in a trim control displacement band of 1.3 inches. The large trim control displacement bands increased pilot workload when attempting to maintain desired attitudes during maneuvering flight (para 11). The large longitudinal and lateral trim control displacement bands of the JOH-58C remain a shortcoming as previously reported for the standard OH-58C helicopter (ref 10, app A).

9. The directional control breakout force (including friction) was 4.0 pounds right and 4.5 pounds left. The directional control breakout force (including friction) of the

standard OH-58C was 6.8 pounds right and 5.5 pounds left. The directional control system did not incorporate a force trim mechanism; therefore, no control centering existed. Although there was no directional control centering, the directional control system characteristics are satisfactory. The directional control system characteristics failed to meet the requirements of paragraph 3.3.10 of MIL-H-8501A, in that, there were no positive self-centering characteristics.

Static Lateral-Directional Stability

10. The static lateral-directional stability characteristics of the JOH-58C were evaluated at the conditions listed in table 1. Test results are presented in figures E-4 through E-9. Static directional stability was positive (left directional control required to maintain right sideslip). Effective dihedral was positive for right sideslips (right lateral control required) but approached neutral for left sideslips at most conditions. Side force characteristics were positive (increasing right roll attitude and increasing right sideslip). The directional SAS had no apparent effect on the static lateral-directional stability characteristics. The static lateral-directional stability characteristics of the JOH-58C were similar to the standard OH-58C (ref 10, app A). The pilot had adequate cues of an out-of-trim condition and was able to correct this condition easily. The static lateral-directional stability characteristics of the JOH-58C are satisfactory.

Maneuvering Stability

11. The maneuvering stability characteristics of the JOH-58C were evaluated in left and right steady turns at the conditions listed in table 1. Maneuvering stability data are presented in figure E-10. Maneuvering stability was positive (aft longitudinal control required to maintain increased center of gravity (cg) normal acceleration) at normal accelerations up to 1.4 g and was similar to the standard OH-58C. Maintaining airspeed control within 2 knots at a bank angle of 45 degrees (1.4g) required ± 1 inch of longitudinal control displacement. Maintaining bank angle at 45 degrees was difficult because of the aircraft's pitch up divergence ("dig in" tendency), the large longitudinal and lateral trim control displacement bands, and the moderate airframe vibrations (VRS 4). The standard OH-58C had a similar "dig in" tendency and high pilot workload at bank angles of 45 degrees. At all bank angles the pilot workload in the JOH-58C was essentially the same as in the standard OH-58C. No qualitative or quantitative differences were noted SAS ON or OFF. The pitch up divergence at 1.4g or 64 knots calibrated airspeed (KCAS) in the JOH-58C remains a shortcoming as previously reported for the standard OH-58C (ref 10, app A).

Dynamic Stability

Short-Term (Gust Response):

12. The lateral-directional short-term dynamic stability characteristics of the JOH-58C were evaluated at the test conditions listed in table 1. Gusts were simulated by 0.5 second duration directional control pulse inputs of up to 1 inch, directional control doublets, and releases from steady-heading sideslips. The aircraft lateral-directional gust response characteristics were also evaluated in light turbulence. Data for pulses are presented in figures E-11 to E-127. Data for doublets are presented in figures E-128 to E-131. Data for releases from steady heading sideslips are presented in figures E-132 to E-139.

13. The short-term rate damping provided by the SAS improved the aircraft's gust response in light turbulence. The lateral-directional gust response observed in forward flight with SAS ON was highly damped. The highly damped lateral-directional response was an improvement over the easily excited lateral-directional oscillations of the standard OH-58C (ref 10, app A). The lateral-directional short-term dynamic stability characteristics of the JOH-58C in forward flight with SAS ON are satisfactory.

14. The lateral-directional gust response observed in forward flight with SAS OFF was oscillatory and easily excited. The SAS OFF lateral-directional short-term dynamic stability characteristics of the JOH-58C in forward flight are similar to those previously reported as a shortcoming for the standard OH-58C (ref 10).

15. One-inch directional pulse inputs at selected azimuths in low-speed flight were tested with SAS ON with pilot and copilot doors installed and removed. The JOH-58 helicopter response to a simulated gust (pulse input) was characterized by a rapid yaw acceleration. Consequently, moderate yaw rates developed. With SAS ON, these rates resulted in momentary saturation of the SAS actuator and the peak yaw rates were approximately 20 degrees/second. Generally, the aircraft returned to the trim condition following a directional pulse input. However, at the 210 degree relative azimuth at 30 KTAS a right pulse input was characterized by an increasing right yaw and divergence from the trim azimuth (fig. E-95). No qualitative or quantitative differences were observed with the pilot and copilot doors removed. The SAS ON directional gust response in low-speed flight was moderately damped.

16. The aircraft was hovered in gusty wind conditions with SAS ON. Rate damping provided by the SAS improved the JOH-58C gust response. Though increased damping provided by directional SAS reduced the yaw attitude excursions in a hover, yaw attitude excursions were greater than 3 degrees and frequent (every second), moderate ($\pm 1/4$ to $1/2$ inch) pedal inputs were required to maintain heading at these conditions (HORS 5).

17. One-inch directional pulse inputs at selected azimuths in low-speed flight were conducted SAS OFF. Maximum yaw rates with SAS OFF were occasionally twice as high as those with SAS ON. SAS OFF aircraft response to the simulated gust was less predictable than with SAS ON, resulting in variable yaw rates. The aircraft seldom returned to the trim azimuth following a pulse input. Figure E-74 shows the variable yaw rate following a right directional pulse at 20 KTAS which resulted in divergence from the trim azimuth. No qualitative or quantitative differences were observed with the pilot and copilot doors removed. The SAS OFF short term dynamic stability characteristics observed in low-speed flight in the yaw axis were lightly damped.

18. The aircraft was hovered in gusty wind conditions SAS OFF. Aircraft response while hovering in gusty winds resulted in increasing yaw rates. Frequent (every second), moderate ($\pm 1/2$ inch) pedal inputs were required to maintain heading within ± 3 degrees in a hover (HORS 6).

Long Term:

19. Spiral stability characteristics of the JOH-58C were evaluated by observing aircraft response to control releases from left and right coordinated turns. Data are presented in

figures E-140 to E-147. The JOH-58C exhibited convergent spiral stability in both left and right turns SAS ON and OFF up to 5 degrees of bank. SAS ON, the spiral stability was convergent up to 10 degrees angle of bank. The spiral stability characteristics of the JOH-58C SAS ON and OFF are satisfactory.

20. Longitudinal long term response was evaluated by trimming the aircraft at the desired airspeed and then decreasing airspeed by 10 knots, using only cyclic control. The cyclic was then returned to the trim position and the helicopter response was observed. Time history data are presented in figures E-148 through E-151. The standard OH-58C longitudinal response was convergent and moderately damped and the JOH-58C showed a similar response. At 67 KCAS, SAS ON the aircraft was convergent in all axes. At 101 KCAS, SAS ON or OFF the predominant characteristic was a slowly diverging roll which was easily controlled. The longitudinal long term response of the JOH-58C is satisfactory.

Controllability

21. The directional control response (angular rate one second after a one-inch control displacement) and control sensitivity (maximum angular acceleration per one-inch control displacement) of the JOH-58C were evaluated at the conditions listed in table 1. Step inputs during low speed flight were limited to 1/4 inch due to the occurrence of main transmission overtorque during recovery from right yaw rates during a hover.

22. Data for directional controllability characteristics are presented in figures E-152 through E-157. The aircraft responded in the proper direction within 0.2 seconds after the input and no objectionable coupling was noted. The JOH-58C with SAS ON had increased yaw rate damping as compared to the standard OH-58C (ref 10, app A). However, SAS was quickly saturated and the high control sensitivity was similar to SAS OFF sensitivity. Yaw rate continually increased until recovery was initiated. Directional response was satisfactory during recovery but a tendency to overcontrol was noted at the 270 degree azimuth. At the moderate gross weights tested, increasing yaw rates and insufficient power margin required increased pilot attention to torque limits. Moderate ($\pm 1/2$ inch) but smooth directional control movements were required to arrest right yaw rates. No repeatable data were obtained during controllability tests above 15 KTAS at the 270 degree azimuth due to frequent SAS saturation and the $\pm 1/4$ to $1/2$ inch directional control inputs required to maintain trim conditions. The directional controllability characteristics of the JOH-58C with SAS OFF were characterized by more rapid accelerations in the yaw axis, and were similar to the standard OH-58C which were reported as a shortcoming. The high control sensitivity SAS ON and OFF resulting in directional overcontrol remains a shortcoming in the JOH-58C.

Low-Speed Flight Characteristics

General:

23. Low-speed flight characteristics were evaluated to determine the effects on handling qualities due to the installation of the directional SAS, larger tail rotor, and engine droop kit. Low-speed flight testing was conducted to simulate hovering in winds by stabilizing in formation with a calibrated ground pace vehicle at a skid height of approximately 10 feet

at relative azimuths (measured clockwise from the nose of the aircraft) from 0 degrees to 350 degrees. The low-speed flight characteristics for this aircraft will be discussed by reference to one of three regions (fig. A): 290 degrees clockwise to 120 degrees (region A), 120 degrees clockwise to 240 degrees (region B) and 240 degrees clockwise to 290 degrees (region C). Additional low speed tests were conducted by initiating a left or right yaw rate and maintaining fixed directional and collective controls while in the weathercock stability region (120 to 240 deg). Upon reaching the region boundary, recovery was initiated.

24. HQRS were assigned in accordance with the scale in figure D-1 to describe the pilot workload to conduct a simulated mission task of hovering in winds. The standards for desired mission performance required maintaining the aircraft within ± 3 degrees of desired heading and ± 2 feet of desired skid height. Although the HQRS may be different for actual hover in winds (as opposed to the simulated task) the ratings are useful for quantifying the effects on pilot workload of the SAS and of varying wind speed and direction. Tests were conducted SAS ON and OFF at the test conditions listed in table 1. Low-speed flight characteristics data are presented in figures E-158 through E-208. No qualitative or quantitative differences were observed with the pilot and copilot doors removed. Figure B shows a HQRS summary for azimuths tested in low-speed flight.

Region A:

25. At 3410 feet, the JOH-58C had 30% margin remaining at 30 KTAS with SAS ON or OFF (fig. E-162 and E-163). Wind tunnel tests have shown main rotor vortex interference with the tail rotor to occur between 10 and 20 knots from the 280 to 320 azimuth (ref 10, app A). Although directional control excursions were small ($\pm 1/4$ inch) from 290 to 300, large longitudinal cyclic trim changes were required. At the 300 degree azimuth there was a large (1 inch) aft longitudinal cyclic trim change required as airspeed was increased from 20 to 25 KTAS. A similar longitudinal trim change was observed at the 290 azimuth at 25 KTAS SAS ON and 30 KTAS SAS OFF. These large aft longitudinal trim changes were not observed at the 310 or 280 azimuths. The SAS ON handling qualities in region A from 290 degrees to 120 degrees were improved from the standard OH-58C (ref 10). The low speed handling qualities of the JOH-58C aircraft in Region A with SAS ON are satisfactory.

Region B:

26. In rearward flight (Region B), SAS ON handling qualities ratings were improved from HQRS 5 (standard OH-58C) to HQRS 3 to 4. Only occasional moderate directional control inputs ($\pm 1/4$ to $1/2$ inch) were required to maintain the desired performance criteria (para 24). Excessive pitch and yaw excursions in rearward flight in the standard OH-58C were previously reported as a deficiency (ref 10). The pilot workload in the directional axis (as indicated by directional control excursions) with the SAS ON was significantly reduced in the JOH-58C. The maximum workload occurred at the 225 azimuth at 25 KTAS (fig. E-170). The high pilot workload in the longitudinal axis (± 1 inch longitudinal cyclic inputs) at the 225 degree azimuth from 10 to 20 KTAS

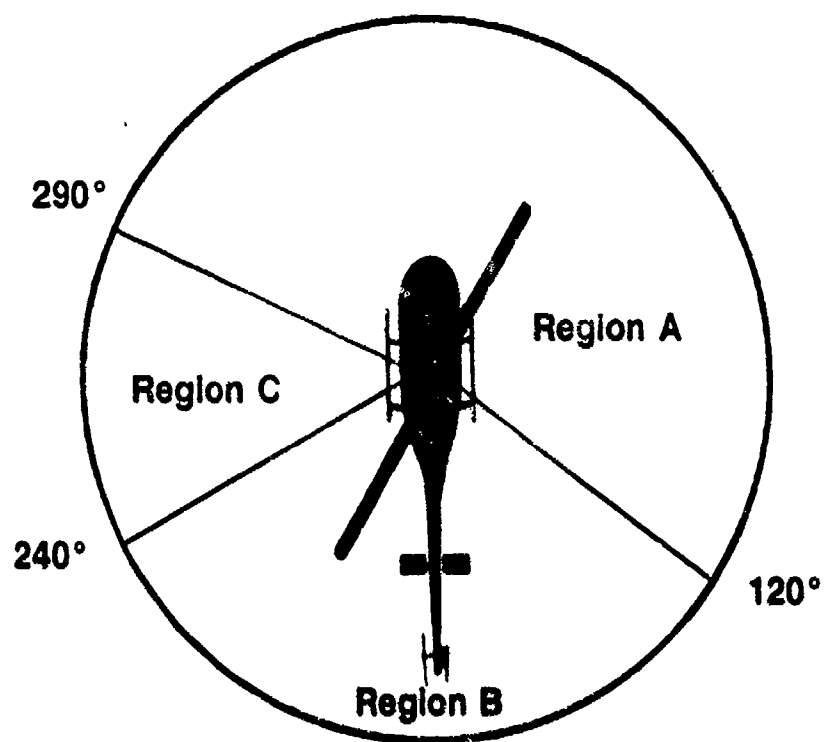


Figure A. Low Speed Flight Regions

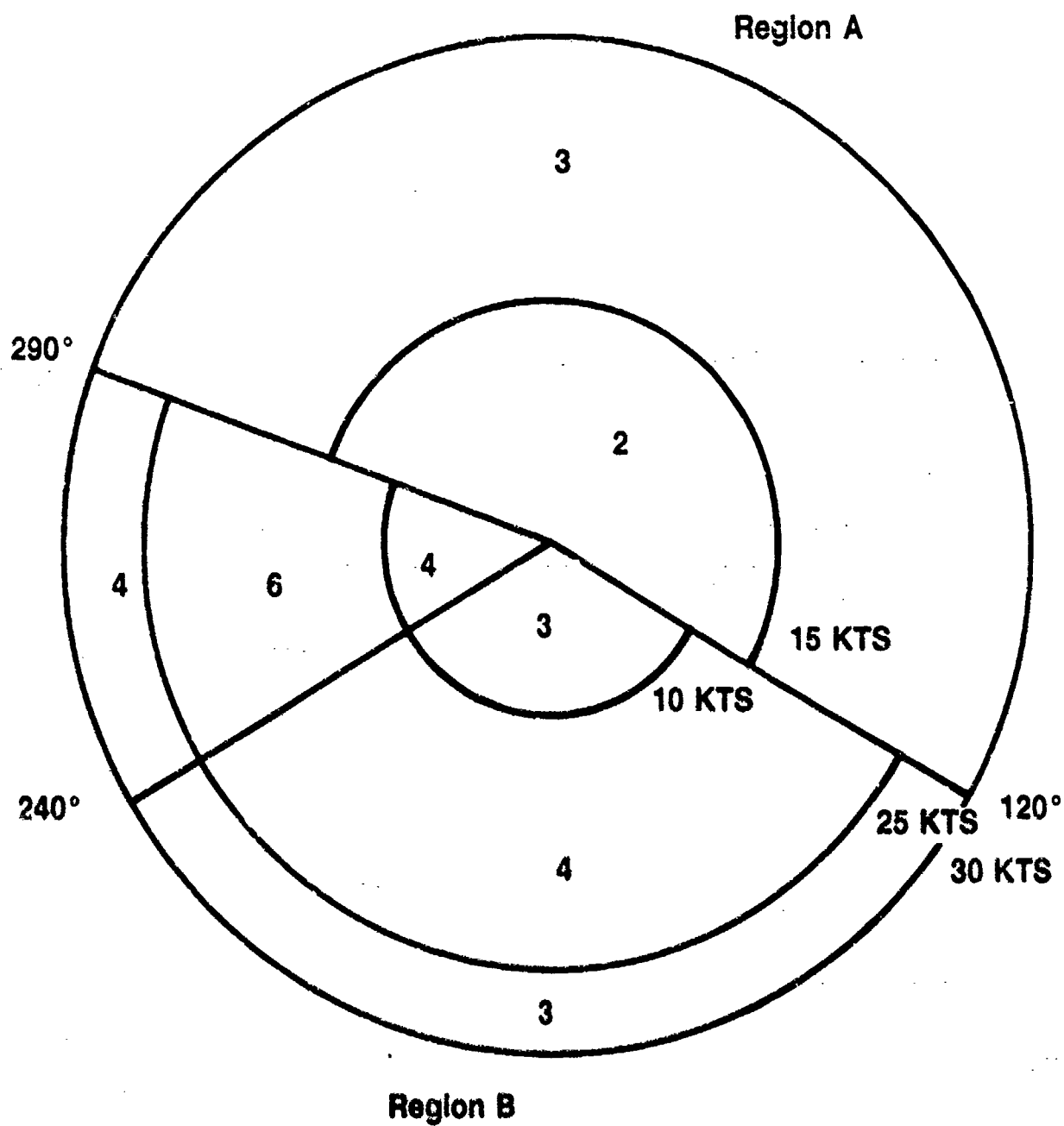


Figure B. SAS ON HQR Summary for Low Speed Flight

was similar to that reported in rearward flight in the standard OH-58C. Additionally, a large aft longitudinal cyclic trim change was required to maintain a 5 knot speed increase above 10 KTAS. The high pilot workload in the longitudinal axis in rearward flight from 10 to 20 KTAS is a shortcoming. Consideration should be given to installation of a SAS in more than one axis to improve the rearward flight handling qualities of the JOH-58C.

27. In addition to evaluating handling qualities in steady heading, constant airspeed flight, the following technique was used to simulate hovering turns in winds. Yaw rates of approximately 10 degrees/second and 20 degrees/second were established prior to entering the weathercock stability region (region B); then, directional and collective controls were fixed until recovery was initiated at the region boundary. Data are presented in figures E-193 through E-208. The limited authority (7% of full control travel) directional SAS was saturated at yaw rates greater than 6 degrees/second. Consequently, SAS was saturated at the initial trim conditions for these tests. Current Aircrew Training Manual (ATM) (ref 11, app A) standards require constant rate hover turns not to exceed 22.5 degrees/second. SAS would be almost continuously saturated during hover turns operationally.

28. Right yaw rates at 10 KTAS with SAS ON or OFF resulted in a continued right yaw rate which decreased to approximately 5 degrees/second when passing the 180 degree relative azimuth. Upon reaching the 180 degree azimuth, a rapid right yaw acceleration occurred which resulted in a yaw rate of approximately 50 degrees/second at the recovery azimuth of 120 degrees. Recovery at the 120 degree azimuth with a right yaw rate of 50 degrees/second (slowest observed) resulted in a 10 degree overshoot with SAS ON. Recoveries at the 120 azimuth were not further attempted due to the increased torque requirements and possibility of a main transmission overtorque. The recovery technique developed to prevent overtorque was to increase left pedal gradually, arresting the yaw rate at 360 degree azimuth (aircraft aligned in the direction of travel). At 15 KTAS, a 10 degrees/second right yaw rate with SAS ON and 20 degrees/second rate SAS ON or OFF were similar to the response at 10 KTAS. However, the 10 degree/second right yaw rate with SAS OFF resulted in the yaw rate decreasing to zero at approximately 230 degrees relative azimuth, then an accelerating left yaw rate developed which was arrested easily at the 360 degree relative azimuth. At 20 KTAS, a 20 degree/second right yaw rate with SAS ON resulted in a response similar to the response at 10 KTAS. All other initial right yaw rates at 20 KTAS SAS ON and OFF resulted in a slight overshoot of the 240 degree azimuth followed by an accelerating left yaw rate which was easily arrested as the aircraft aligned in the direction of travel. No attempt to recover the resultant left yaw rate was made prior to the 360 degree relative azimuth. SAS appeared to assist in maintaining trim yaw rate as evidenced by the delayed onset of the resultant left yaw rate which occurred with increasing airspeeds. During this test, large cyclic trim changes were required to maintain desired speed. Passing from 210 through 150 degrees relative azimuth required approximately 2 inches of aft cyclic followed by approximately 2 inches of forward cyclic at the 120 degrees relative azimuth. An additional 1 to 2 inches of forward cyclic were used during recoveries in the direction of travel to maintain desired speed. Although SAS remained saturated through most of this test, the limited authority directional SAS appeared to assist in maintaining desired trim conditions. While attempting to maintain a constant turn rate in a right pedal spot turn,

with SAS ON, in winds of 10 to 12 knots, the pilot was frequently required to make left and right, moderate ($\pm 1/4$ to $1/2$ inch) pedal inputs and occasionally required to make large (± 1 inch) pedal inputs (HQRS 5). The longitudinal cyclic trim change required to remain within 2 feet of a spot during a pedal turn was large (± 3 inches). Low speed flight effects on right yaw rates in the weathercock stability region were rapid right yaw accelerations from the 150 to 120 degree azimuths and decreasing right yaw rates from the 240 to 150 degree azimuths.

29. Left yaw rates SAS ON or OFF resulted in progressively increasing left yaw rates from 120 to 210 degrees. An extremely rapid left yaw acceleration occurred at the 210 azimuth. At 16 KTAS, recovery was accomplished at 10 degrees beyond the region boundary SAS ON and OFF. During application of right pedal to arrest yaw rate, a rapid, approximately 10 degree nose down pitch occurred. Recovery at the region boundary with speeds greater than 10 KTAS was not attempted due to the large (greater than ± 30 percent) torque changes required and rapid pitch rate observed during recovery at 15 KTAS SAS ON. Instead, recovery was initiated at the region boundary and was completed by the 360 degree azimuth (direction of travel). No significant differences were noted SAS ON or OFF above 10 knots. At airspeeds greater than 10 KTAS and at the instant the yaw acceleration at the 210 azimuth was experienced, the Master Caution and Engine Oil Bypass Lights illuminated for approximately 1 second. Although the engine oil reservoir was fully serviced, severe sloshing of the oil probably caused activation of the caution lights. During left hover spot turns in winds of 10 to 12 knots, multiple left and right pedal inputs ($\pm 1/2$ inch) were required in an attempt to maintain a constant turn rate with SAS ON. As the aircraft approached the 090 degree relative azimuth, larger (1 inch) left pedal inputs were required in an attempt to maintain the turn. Approaching the 210 degree relative azimuth required larger (1 inch) right pedal inputs to prevent an accelerating left turn. Throughout the maneuver, large longitudinal cyclic trim changes were required to remain within 2 feet of the spot. Low speed flight effects on left yaw rates in the weathercock stability region were increasing left yaw rates from the 120 to 210 degree azimuths and rapid left yaw acceleration from the 210 to 240 degree azimuth.

Region C:

30. In left sideward flight (Region C) yaw attitude excursions of ± 8 degrees observed in the standard OH-58C (reported deficiency, ref 10, app A) were reduced in the JOH-58C with SAS ON. HQRS for 15 to 25 KTAS were HQRS 6 (compared to HQRS 7 in the standard OH-58C), while all other speeds improved to HQRS 4. Moderate pitch, roll, and yaw excursions required moderate-sized control inputs to accomplish the simulated hover task. However, smaller and less frequent pedal inputs were required as compared to the standard OH-58C. Critical azimuths and airspeeds, determined by pilot workload, were 240 to 280 degrees at 15 to 25 KTAS. Large SAS actuator inputs as well as moderate-sized, frequent control inputs in all axes ($\pm 1/4$ -inch directional and $\pm 1/2$ -inch lateral and longitudinal) were required to achieve only adequate performance (HQRS 6). The directional SAS, improved tail rotor system, and engine droop kit moderately improved the low speed flight characteristics of the JOH-58C in Region C, however, workload remains high at the critical azimuths and airspeeds. The moderate pitch, roll,

and yaw excursions between 15 and 25 KTAS at relative wind azimuths between 240 and 280 degrees are a shortcoming.

All Regions with SAS OFF:

31. Low speed SAS OFF flight data are presented in figures E-159 through E-189. Larger and more frequent control inputs were required for all azimuths and airspeeds tested than were required with SAS ON. Qualitatively and quantitatively the directional control was more sensitive than the standard OH-58C. Except for increased directional sensitivity, the handling qualities of the JOH-58C with SAS OFF were similar to the standard OH-58C.

Trim Changes with Power Effects

32. Trim directional control requirements as a function of power were evaluated in an attempt to determine the conditions resulting in main rotor disc vortex interference with the tail rotor. Tests were conducted at the conditions listed in table 1. Results are presented in figures E-209 through E-216. Generally, decreasing engine power required increasing right directional control at all trim airspeeds and sideslips. At all trim airspeeds and sideslips, directional trim changes at 80% and 35% engine torque were accompanied by large (± 10 degrees) sideslip excursions and required restabilizing on desired trim sideslip prior to further power reduction. The characteristic directional trim changes for right sideslips were similar at all airspeeds and power settings. The characteristic directional trim changes for left sideslips showed increasing left pedal requirements with decreasing airspeed at all power settings. Though accuracy of sideslip beyond 35 degrees and airspeed below 30 KCAS could not be determined due to instrumentation limitations, a significant directional trim discontinuity was observed at 20 KCAS with approximately 40 degrees left sideslip. Rapid right yaw accelerations requiring frequent large (1 inch) pedal inputs to remain ± 10 degrees of desired sideslip occurred between 70 and 85% engine torque. Buffeting of the tail was felt by the pilot through the airframe. The right yaw accelerations and buffeting did not occur below 70% engine torque. No engine torque setting above 85% was attempted due to the possibility of main transmission overtorque when arresting the right yaw accelerations. On a subsequent flight, this significant trim discontinuity was not observed under similar conditions. Figure E-216 shows a time history of this occurrence. Directional trim changes with power did not provide sufficient data to determine the area of main rotor disc vortex interference with the tail rotor. Recommend alternate methods of determining main rotor vortex interference be investigated using more accurate measurements of low airspeed, sideslip, and tail boom loads.

Mission Maneuvering Characteristics

33. Mission maneuvers were qualitatively evaluated in the JOH-58C at the conditions listed in table 1. Time histories of some maneuvers are presented in figures E-217 through E-254. The maneuvers were conducted in accordance with the OH-58 helicopter ATM (ref 11, app A) and were evaluated SAS ON and OFF. Pilot workload increased with the SAS OFF for all maneuvers conducted. Aircraft controllability was not in question, but SAS OFF flight required increased pilot compensation to maintain the ATM

standards of each maneuver. SAS ON flight, however, reduced pilot workload which enhanced mission capability. Slope landings, masking/unmasking and nap-of-the-earth flight were easier to accomplish in the JOH-58C than in the standard OH-58C because rate damping reduced aircraft yaw attitude excursions. Hovering in actual winds was moderately improved with SAS ON. The occasionally saturated SAS resulted in moderate yaw excursions at the critical azimuth from 15 to 25 KTAS. An OGE hover spot turn of approximately 10 degrees/second to the left resulted in a rapid left yaw acceleration when passing the 270 degree relative azimuth. Approximately 2 inches of right pedal were required to arrest the increasing yaw rate. The mission maneuver characteristics of the JOH-58C helicopter with a directional SAS improved mission capability. The limited authority (7% of full control travel) directional SAS was occasionally saturated during hover with a left crosswind and always saturated during maneuvers requiring yaw rates greater than approximately 6 degrees/second.

Directional SAS Effects

34. The effect of a directional SAS was to provide increased yaw rate damping which improved aircraft gust response (paras 13 and 16). However, the limited authority SAS saturated at low (6 degrees/second) yaw rates. The characteristic of the hovering aircraft with wind in the weathercock region is rapid yaw accelerations SAS ON and OFF from 150 to 120 and 210 to 240 relative wind azimuths (paras 26 and 27). In the region of tail rotor vortex ring state the aircraft demonstrated moderate pitch, roll, and yaw excursions with SAS ON and OFF (para 28). Sufficient data to define the area of main rotor disc vortex interference with the tail rotor were not obtained (para 32). Additionally, the small power margin remained a significant factor when arresting yaw rates despite testing at weights below 3000 lb (maximum gross weight is 3200 lb) and low density altitudes. The concept of a SAS which damps uncommanded yaw rates demonstrates potential for reducing the conditions conducive to LTE. However, the limited authority (7% or full control travel) directional SAS saturated at small yaw rates (6 degrees/second) and did not significantly reduced the characteristic high yaw rates of moderate yaw attitude excursions observed in the JOH-58C.

MISCELLANEOUS

Cockpit Evaluation

35. The ease of the inadvertent main transmission overtorque or engine overtemperature condition was previously reported as a shortcoming (ref 10, app A). With the improved tail rotor and engine droop modifications applied, the aircraft is more responsive to pedal or directional SAS inputs. Consequently, with the pilot's attention directed outside the cockpit during NOE flight, an increased engine and tail rotor response will result in an increased possibility of an overtorque or overtemperature condition. The ease of main transmission overtorque or engine overtemperature condition in the OH-58C remains a shortcoming in the JOH-58C.

Aircraft Pitot-Static System Calibration

36. The helicopter pitot-static system was calibrated in level flight, climbs, and autorotations using the trailing bomb technique. Data are presented in figure E-255. The position error of the JOH-58C helicopter was similar to the standard OH-58C. The JOH-58C ship airspeed system was satisfactory.

CONCLUSIONS

GENERAL

37. The following conclusions were reached upon completion of testing.

- a. The limited authority SAS will not significantly reduce the conditions conducive to encountering LTE.
- b. The limited authority directional SAS does not significantly reduce the characteristic high yaw rates and moderate yaw attitude excursions in the JOH-58C.
- c. The flying qualities of the JOH-58C were moderately improved in comparison to the standard OH-58C.
- d. The concept of SAS which damps uncommanded yaw rates demonstrates potential for reducing the conditions conducive to LTE.

SHORTCOMINGS

38. The following shortcoming was previously identified as a deficiency in the standard OH-58C: Moderate pitch, roll, and yaw excursions between 15 and 25 KTAS at relative wind azimuths between 240 and 280 degrees (para 30).

39. The following shortcoming was previously reported as high pilot workload: The high pilot workload in the longitudinal axis in rearward flight at 10 to 20 KTAS (para 26).

40. The following shortcomings were previously identified in the OH-58C and remain shortcomings:

- a. Ease of main transmission overtorque or engine overtemperature condition (para 35).
- b. The high control sensitivity resulting in directional overcontrol (para 22).
- c. Pitch up divergence ("dig in" tendencies) at load factors near 1.4g at 64 KCAS (para 11).
- d. Large longitudinal and lateral trim control displacement bands (para 8).

SPECIFICATION COMPLIANCE

41. The JOH-58C failed to meet the requirement of paragraph 3.3.10 of MIL-H-8501A in that there were no positive self-centering characteristics for the directional control system (para 9).

RECOMMENDATIONS

42. The following recommendations were made:

- a. The shortcomings reported in paragraphs 38, 39, and 40 should be corrected as soon as possible.
- b. Consideration should be given to installation of a SAS in more than one axis to improve the rearward flight handling qualities of the JOH-58C (para 26).
- c. Alternate methods of determining main rotor vortex interference should be investigated using more accurate measurements of low airspeed, sideslip, and tailboom loads (para 32).

APPENDIX A. REFERENCES

1. Final Report, AEFA Project No. 83-12, *Government Pilot Evaluation of the BHTI 206/Ring Fin Tail Rotor*, January 1985.
2. Final Report, AEFA Project No. 83-15, *Preliminary Airworthiness Evaluation of the OH-58C with 3-Axis Stability Control Augmentation System and Improved Tail Rotor*, October 1983.
3. Final Report, AEFA Project No. 85-03, *Airworthiness and Flight Characteristics of the JOH-58C (OH-58X Surrogate Helicopter)*, February 1986.
4. Letter, AVSCOM, AMSAV-8, 29 December 1986, subject: Loss of Tail Rotor Effectiveness (LTE) Evaluation of the OH-58C with Directional SCAS ONLY Operable. (Test Request)
5. Test Plan, AEFA Project No. 86-22, *Loss of Tail Rotor Effectiveness (LTE) Evaluation of the OH-58C with Directional SCAS*, January 1987.
6. Operator's Manual, TM 55-1520-235-10, *Army OH-58C Helicopter*, 7 April 1978, with change 40, 21 November 1986.
7. Letter, AVSCOM, AMSAV-E, 23 January 1987, with revision 4 dated 15 June 1987, subject: Airworthiness Release for JOH-58C, S/N 70-15349 for the Directional SCAS/Tail Rotor Boost Evaluation and HICAP Instrumentation Evaluation.
8. Military Specification, MIL-H-8501A, *Helicopter Flying and Ground Handling Qualities; General Requirements for*, 7 September 1961, with amendment 1, 3 April 1962.
9. Flight Test Manual, Naval Air Test Center, FTM No. 104, *Stability and Control*, 10 November 1983.
10. Final Report, AEFA Project No., 76-11-2, *Airworthiness and Flight Characteristics Evaluation of the OH-58C Interim Scout Helicopter*, April 1979.
11. Aircrew Training Manual (ATM), FC1-215, *Observation Helicopter OH-58*, 30 October 1984.
12. Aviation Unit and Intermediate Maintenance Manual, *OH-58A and OH-58C*, TM 55-1520-228-23-1, dated 4 August 1978, with change 39, 1 December 1985.

APPENDIX B. AIRCRAFT DESCRIPTION

1. The test helicopter, JOH-58C US S/N 70-15349, was a standard OH-58C (built by Bell Helicopter Textron, Inc. (BHTI)), modified with a SFENA directional Stability Augmentation System (SAS). The standard OH-58C has a single two-bladed, semirigid, teetering main rotor and a single two-bladed, delta-hinged, semirigid, teetering tail rotor. A detailed description of the OH-58C is included in the operator's manual (ref 6, app A). The major aircraft modifications included the Bell 206L-3 tail rotor (65 in. diameter) with accompanying drive shafting and gearbox (modification work order (MWO) 55-1520-228-50-25), the engine droop kit (MWO 55-1520-228-50-26), and the directional SAS. Figure B-1 shows the test aircraft. Figures B-2 and B-3 show the SAS cockpit controls. Figure B-4 shows the internally mounted test instrumentation.

2. The test helicopter was weighed by the U.S. Army Aviation Engineering Flight Activity (AEFA) personnel prior to testing. The weight and longitudinal center of gravity (cg) data were 2313/114.49, no fuel and 2770/114.87 full fuel.

3. A complete flight control rigging check was performed by AEFA quality control personnel prior to the initiation of testing. All flight control rigging was within tolerances specified in reference 7, appendix A. The data for the tail rotor rigging check is presented below:

Tail Rotor	Left	22 degrees 54 minutes
	Right	-8 degrees 36 minutes

Rigging was accomplished in accordance with the rigging procedures specified in reference 12 except that hydraulic power was applied, the directional SAS actuator was centered, and electrical power was OFF.

4. The improved tail rotor (MWO 55-1520-228-50-25) is depicted in figure B-5. It incorporates the same airfoil section as the standard OH-58C tail rotor but the diameter is increased by 3 inches to 65 inches. Maximum pitch angle values are increased to the values shown in paragraph 3. The tail rotor drive shafting and gearbox were changed per the MWO. The drive shaft is a seven piece shaft (fig. B-6). Each piece in the shaft is identical and has a larger diameter than the one-piece standard drive shaft. The tail rotor gearbox continuous rating is increased from 65 to 85 shaft horsepower.

5. The JOH-58C had a limited-authority (7% of full control travel), prototype single-axis SAS. The SAS uses a rate gyro computer and actuator to provide rate damping in the directional axis. No attitude retention or attitude hold feature was included in the system tested. Force trim was not provided in the directional controls. The directional SAS includes the following components:

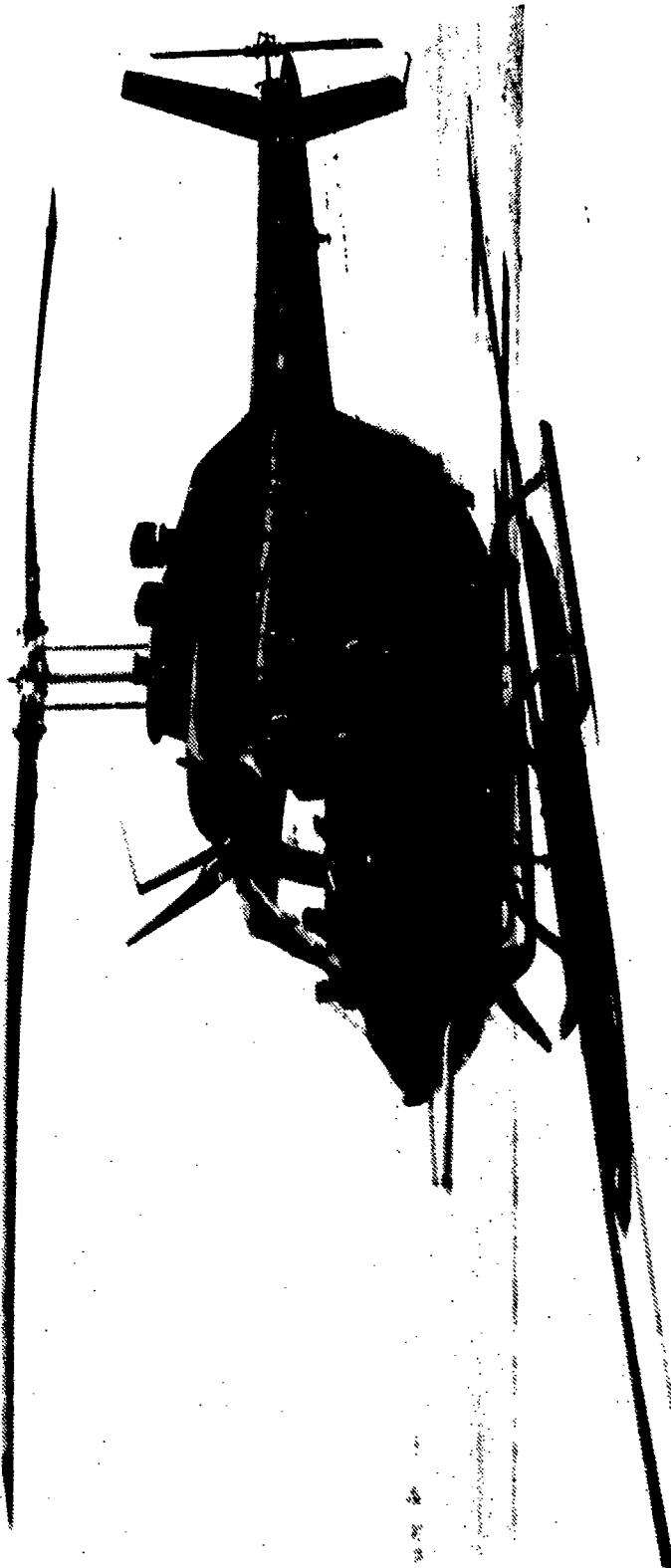


Figure B-1. Test Aircraft



Figure B-2 Cyclic Grip with SAS On/Off Switch

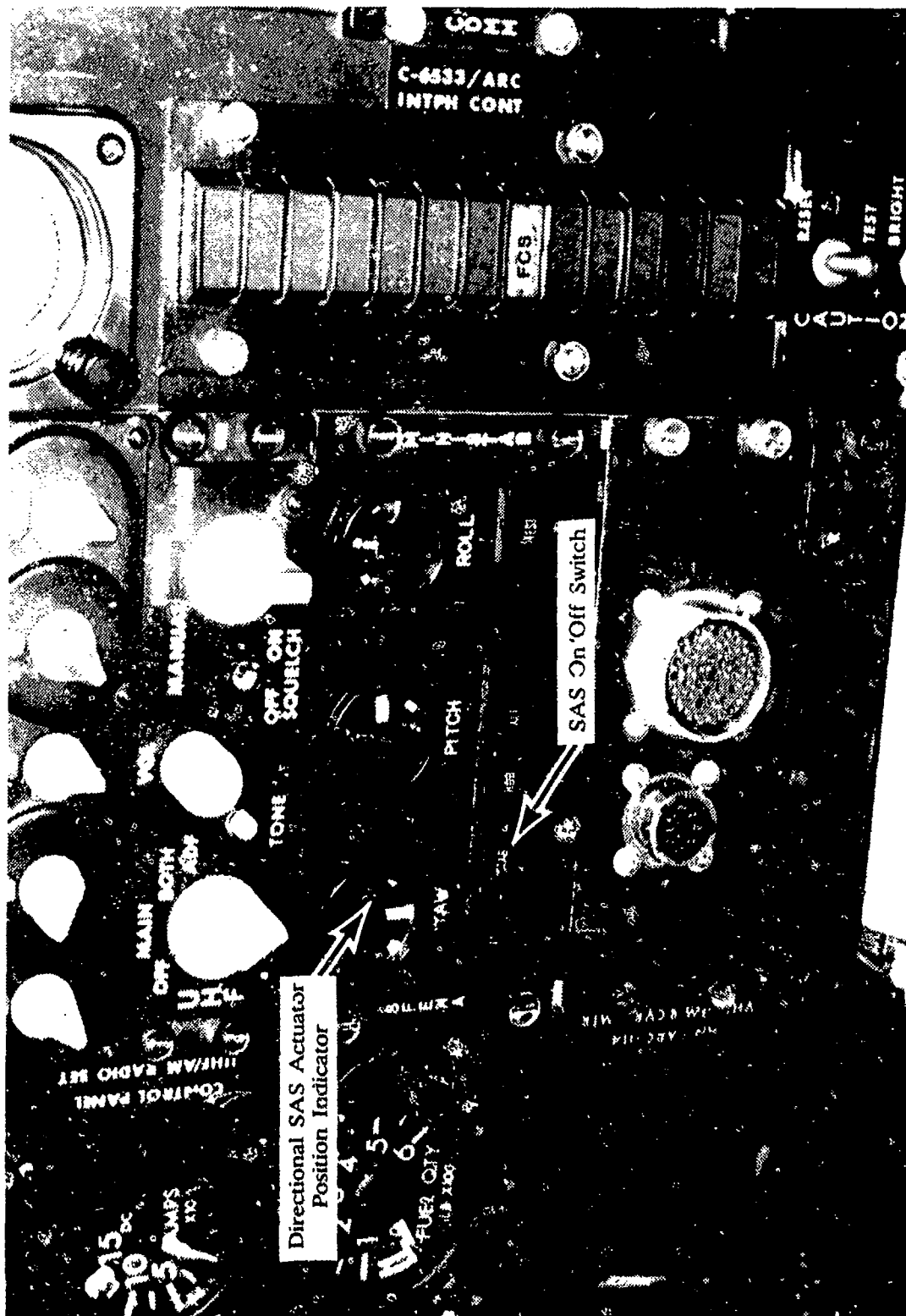


Figure B-3. Instrument Panel SAS Controls



Figure B-4. Test Instrumentation Installation

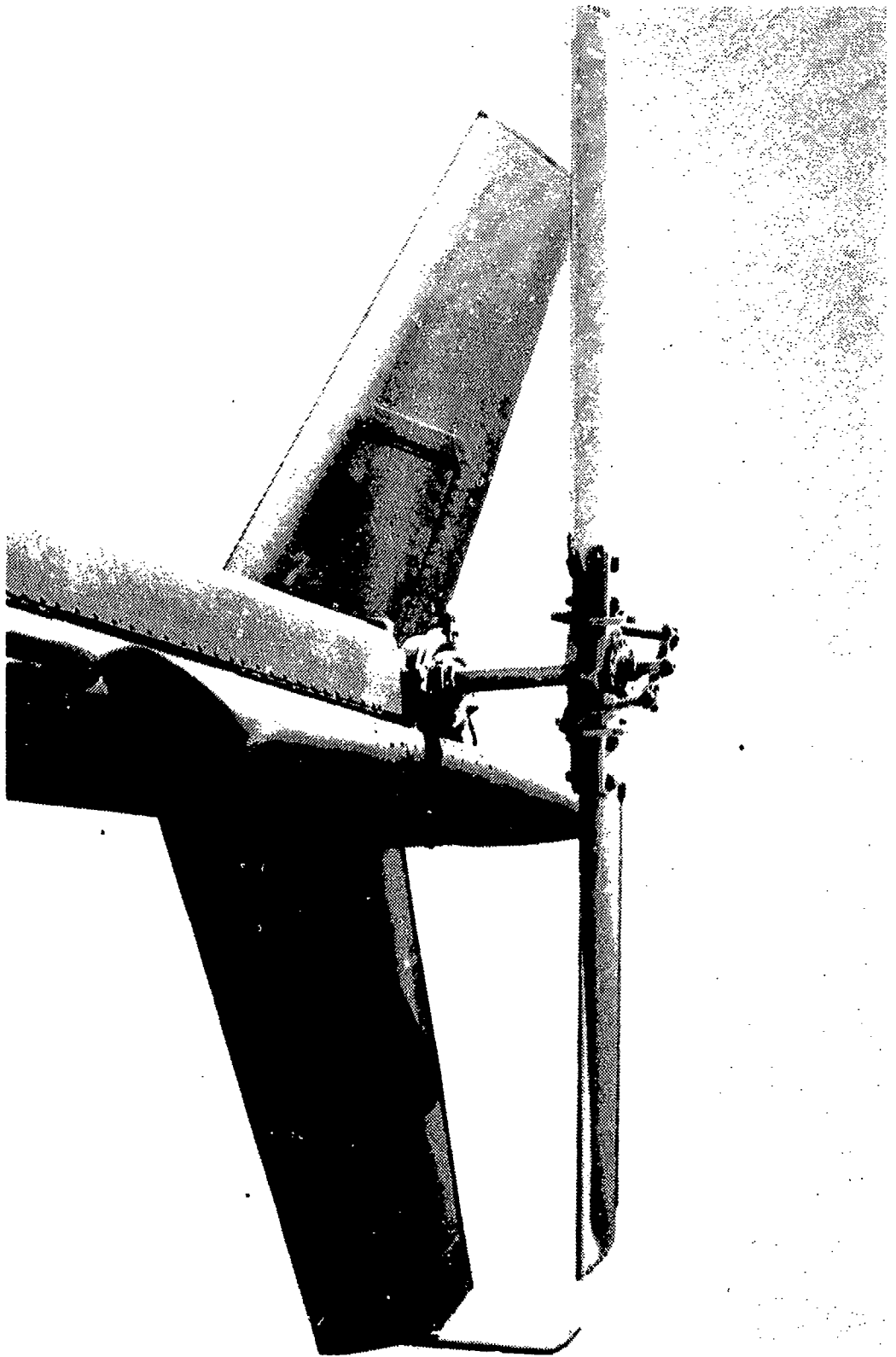


Figure B-5. Improved Tail Rotor



Figure B-6. Tail Rotor Drive Shaft

ITEM	PART NUMBER	QUANTITY	LOCATION
SAS Computer	75258V1M2	1	Avionics Compartment
Directional rod/ actuator assy	10110-001	1	Entrance to tail boom
Air data computer	10980-002	1	Passenger compartment
Junction Box	153-51219-30C	1	Passenger compartment
Yaw Stop Assy	11530	1	Entrance to tail boom
SAS control panel	K28AJM	1	Instrument panel
Pre-Fabricated Harness			
yaw	11368	1	Passenger compartment
50 VA Inverter	PC 50	1	Under pilot's seat
Hydraulic/boosted			
T/R/Assy	206-001-739-7	1	Entrance to tail boom
Actuator Position			
Indicator	X60ACM	1	Instrument Panel

These components were designed for the SFENA 3-axis SAS and therefore the connections were modified for the directional-only configuration.

6. A SAS computer for the directional axis incorporates logic and gain networks to provide rate damping. A rate gyro in the computer senses changes of angular rate of 0.01 degree/second.

7. The SAS control panel is shown in figure B-3. The panel includes a Force Trim button, a STAB button (SAS ON/OFF), a button to engage altitude hold and a system test switch. Only the STAB button was functional for this test. Directional SAS actuator position is indicated on the yaw galvanometer.

8. The SAS power distribution system requires 28V DC, 26V AC and 115V AC single-phase electrical power. The 115V AC, 400 Hz, single-phase power, provided by the upgraded solid state inverter, is for the rate gyro motor and for the computer internal power supplies. The rate gyro output signal is demodulated and applied to a servo amplifier which drives the rate (damping) channels. When the system is OFF, resulting in a zero signal to the servo amplifier, the actuator centers. The actuator is mounted in a directional control tube and contains a DC permanent magnet motor driven by a pulse-width modulating type of servo-amplifier. The $\pm 27V$ motor drive voltage and the $\pm 15V$ feedback pot excitation voltage are derived in the computer power supply.

9. The SAS uses a single actuator mounted in series with the directional control tubes. The actuator has low force output and is used in conjunction with the hydraulically boosted control. The actuator is installed as close as possible to the input valve of the hydraulic booster to isolate the actuator motion from the pilot controls. The mass and friction on the booster side of the actuator is low compared to the pilot's side of the actuator. The SAS actuator stroke is limited to give 6.79% (of full control travel) SAS authority (approximately ± 0.34 in.).

10. A SAS ON/OFF switch is located on the pilot cyclic grip as shown in figure B-2. If the switch is depressed, SAS will engage or disengage.

11. The force trim system is the standard OH-58 force trim system. However, the force trim ON/OFF switch is relocated to the position shown in figure B-3. The thumb button

on the pilot/copilot cyclic stick (fig. B-2) is used for momentary force trim release. There is no force trim in the directional axis.

12. A flight control system (FCS) caution light is provided in the segmented caution panel. When the SAS is disengaged, the series actuator automatically centers and the FCS caution light illuminates momentarily. The FCS light does not illuminate, however, if a SAS failure occurs.

13. SAS operation is accomplished by pressing the STAB button on the SAS control panel or the SAS ON/OFF switch located on the pilot's cyclic grip. SAS operation is monitored using the yaw actuator position indicator (fig. B-3).

14. Prior to flight, a system self-test may be performed. With the SAS OFF, the TEST button is depressed. The test button should light the "1" on the test button. The STAB indicator will show green stripes, the ALT indicator will show red stripes. The FCS caution light will illuminate and the three actuator position indicators will be centered. Position "1" tests only the system indicators. When the TEST button is depressed a second time, the "2" illuminates. The STAB and ALT indicators are initially black. Position "2" tests the system amplifiers and input/output logic. When the STAB indicator is depressed, the green stripes reappear. FCS caution light remains illuminated and the actuator position indicators remain centered. When the test button is depressed a third time to the "0" position, the STAB indicator remains green, the FCS caution light extinguishes. The SAS is then operational for flight.

15. The SAS operates normally when the STAB button or the pilot's SAS ON/OFF switch on the cyclic is depressed. Green and white diagonal stripes appear in the STAB indicator, indicating that power is applied to the system and rate damping is in effect. Attitude retention was not incorporated in the system modified for this test.

16. The FCS caution light and master caution light illuminate momentarily when the SAS is disengaged. the FCS caution light does not illuminate when the SAS fails.

17. The SAS is disengaged by depressing the STAB button. The SAS can also be disengaged by depressing the SAS ON/OFF switch on the pilot's cyclic. Disengagement does not remove power from the system gyro computer.

APPENDIX C. INSTRUMENTATION

1. The test instrumentation system was designed, calibrated, installed, and maintained by the U.S. Army Aviation Engineering Flight Activity. Digital and analog data were obtained from calibrated instrumentation and were recorded on magnetic tape and/or displayed in the cockpit. The instrumentation system consisted of various transducers, signal conditioning units, a 12-bit pulse code modulation encoder, and an Ampex AR 700 tape recorder. Time correlation was accomplished with an onboard, recorded and displayed, Inter-Range Instrumentation Group B format time of day. Various specialized test indicators displayed data to the pilot and engineer continuously during the flight. A boom with the following sensors was mounted on the nose of the aircraft: swiveling pitot-static head, sideslip vane and angle-of-attack vane. The boom airspeed system calibration is shown in figure C-1.

2. The following parameters were displayed on calibrated instruments in the cockpit:

- Airspeed (boom)
- Airspeed (ship)
- Altitude (boom)
- Altitude (ship)
- Rotor speed
- Engine torque
- Turbine outlet temperature
- Fuel flow rate
- Fuel used (totalizer)
- Outside air temperature
- Normal acceleration
- Angle-of-sideslip
- Time of day
- Record counter

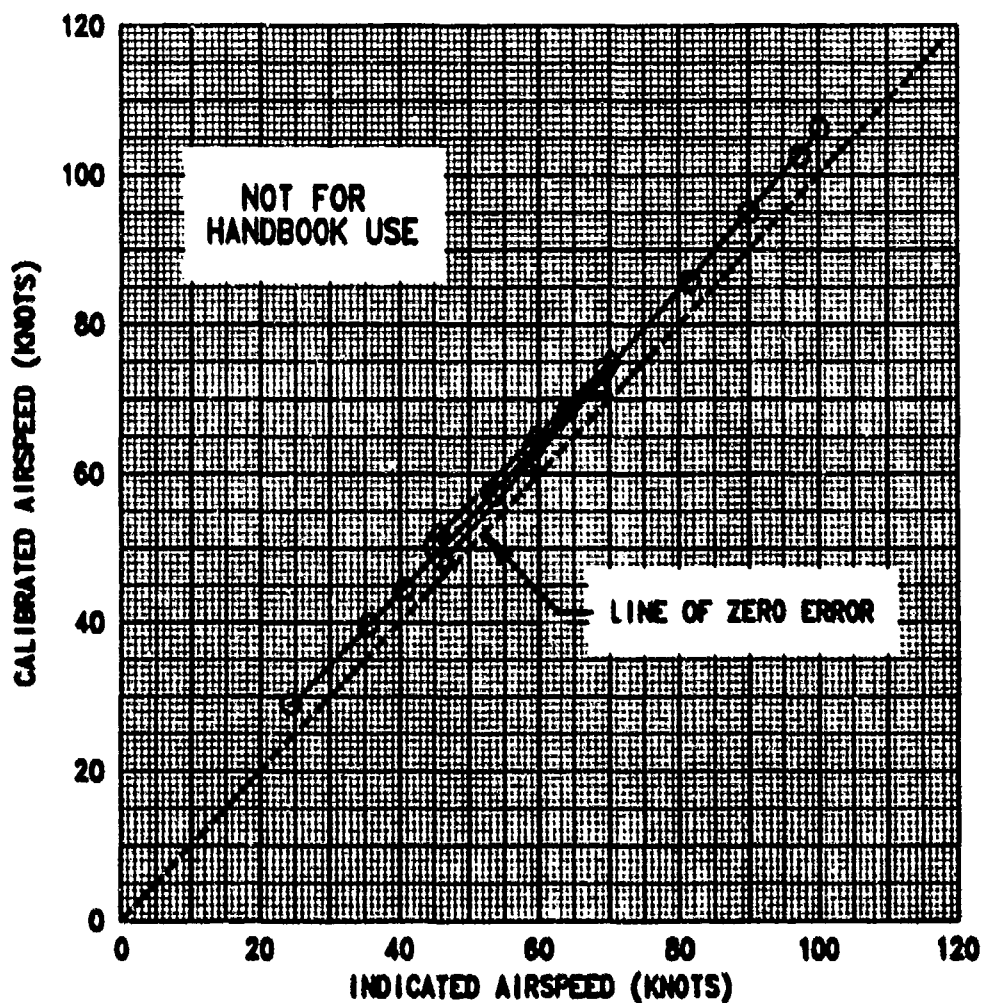
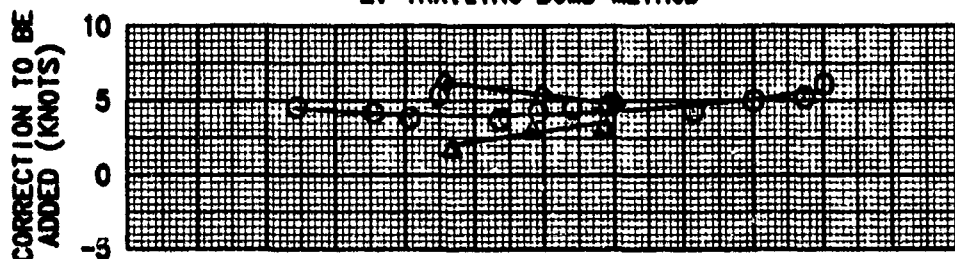
3. The following parameters were recorded on magnetic tape:

- Time code
- Record number
- Fuel used
- Airspeed (boom)
- Altitude (boom)
- Airspeed (ship)
- Altitude (ship)
- Main rotor speed
- Outside air temperature
- Angle-of-sideslip
- Angle-of-attack
- Engine torque
- Turbine outlet temperature
- Gas producer speed
- Power turbine output shaft speed
- Fuel flow rate

FIGURE C-1
BOOM SYSTEM AIRSPEED CALIBRATION
JOH-58C USA S/N 70-15349

SYM	AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	FLIGHT CONDITION
		LONG (FS)	LAT (BL)				
⊙	2940	108.1	0.0	6020	20.5	354	LEVEL
◇	2880	107.8	0.0	5980	20.5	354	CLIMB
△	2900	107.9	0.0	5920	20.5	354	AUTOROTATION

NOTES: 1. CONFIGURATION: CLEAN, DOORS ON
2. TRAILING BOMB METHOD



Control positions

Longitudinal

Lateral

Directional

Collective

Aircraft attitudes and rates

Pitch

Roll

Yaw

Aircraft vertical center of gravity acceleration

Directional SAS actuator position

APPENDIX D. TEST TECHNIQUES AND DATA ANALYSIS METHODS

GENERAL

1. Stability and control data were collected and evaluated using standard test methods as described in reference 9, appendix A. Definitions of deficiencies and shortcomings used during this test are shown below.

a. Deficiency. A defect or malfunction discovered during the life cycle of an item of equipment that constitutes a safety hazard to personnel; will result in serious damage to the equipment if operation is continued; or indicates improper design or other cause of failure of an item or part, which seriously impairs the equipment's operational capability.

b. Shortcoming. An imperfection or malfunction occurring during the life cycle of equipment which must be reported and which should be corrected to increase efficiency and to render the equipment completely serviceable. It will not cause an immediate breakdown, jeopardize safe operation, or materially reduce the usability of the material or end product.

Airspeed Calibration

2. The boom and ship's pitot-static systems were calibrated using the trailing bomb method to determine the airspeed position error. Calibrated airspeed (V_{cal}) was obtained by correcting indicated airspeed (V_i) using instrument (ΔV_{ic}) and position (ΔV_{pc}) error corrections.

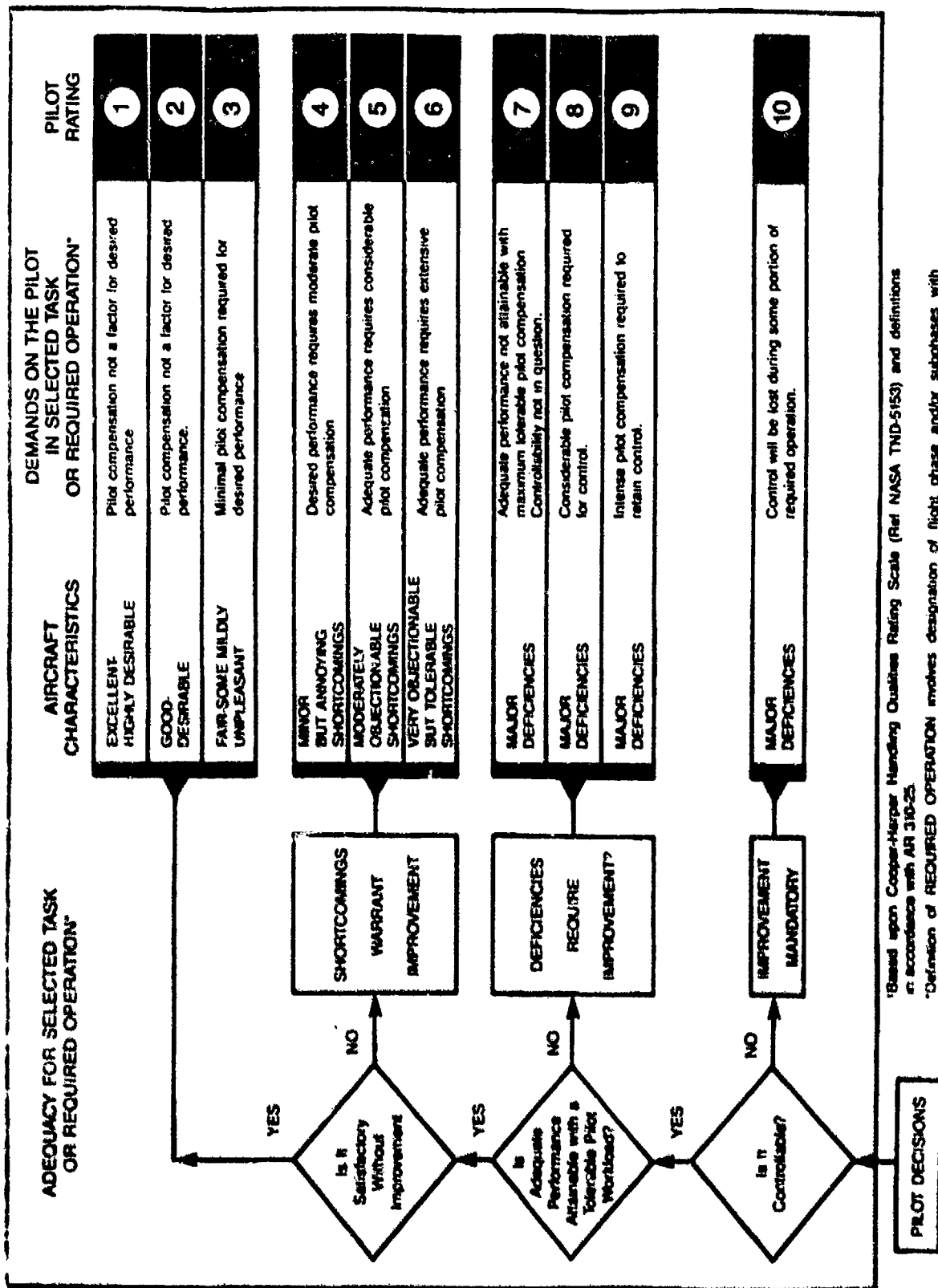
$$V_{cal} = V_i + \Delta V_{ic} + \Delta V_{pc} \quad (1)$$

Aircraft Weight and Balance

3. Prior to testing, the aircraft gross weight and center of gravity (cg) location were determined using calibrated scales. The aircraft was weighed with full instrumentation onboard and without fuel. The aircraft weight was 2313 pounds with a longitudinal cg location at fuselage station 114.49. A fuel cell, site gage, and cockpit fuel gage calibration was accomplished. The fuel weight for each test flight was determined prior to engine start by using the calibrated sight gage.

4. The Handling Qualities Rating Scale presented in figure D-1 was used to augment pilot comments relative to handling qualities and workload.

5. The Vibration Rating Scale presented in figure D-2 was used to augment pilot comments relative to vibrations.



*Based upon Cooper-Harper Handling Qualities Rating Scale (Ref NASA TND-5153) and definitions in accordance with ARJ 310-25.

*Definition of REQUIRED OPERATION involves designation of flight phase and/or subphases with accompanying conditions.

Figure D-1. Handling Qualities Rating Scale

DEGREE OF VIBRATION	DESCRIPTION ¹	PILOT RATING
No vibration		0
Slight	Not apparent to experienced aircrew fully occupied by their tasks, but noticeable if their attention is directed to it or if not otherwise occupied.	1 2 3
Moderate	Experienced aircrew are aware of the vibration but it does not affect their work, at least over a short period.	4 5 6
Severe	Vibration is immediately apparent to experienced aircrew even when fully occupied. Performance of primary task is affected or tasks can only be done with difficulty.	7 8 9
Intolerable	Sole preoccupation of aircrew is to reduce vibration level.	10

¹Based on the Subjective Vibration Assessment Scale developed by the Aeroplane and Armament Experimental Establishment, Boscombe Down, England.

Figure D-2. Vibration Rating Scale

HANDLING QUALITIES

Control System Characteristics

6. These tests were conducted on the ground with hydraulic and electrical power provided by ground power units. A hand-held force gauge was used to measure the force required to move the cyclic control in incremental displacements to the limits of travel. Hysteresis was checked by taking measurements in the increasing and decreasing force directions. The force gauge was also used to measure the force required to move the directional and the collective controls in incremental displacements to the limits of travel in both directions.

Static Lateral-directional Stability

7. These tests were accomplished by trimming the aircraft in coordinated flight at the desired conditions. With collective control fixed, the aircraft was then stabilized at incremental sideslip angles up to 20 degrees left and right of trim while maintaining steady heading at the trimmed airspeed.

Maneuvering Stability

8. The variation of longitudinal control position and force with normal acceleration was determined during steady turns. The test consisted of incrementally increasing normal acceleration (load factor) while holding collective position constant. Steady turns, in both directions, were accomplished by stabilizing and trimming in level unaccelerated flight at the desired test airspeed. Load factor was increased by incrementally increasing bank angle. Ball-centered, constant airspeed, and fixed collective control were maintained during the turn. Rotor speed was not adjusted during the turn. Data were gathered within 1000 feet of the specified test altitude.

Dynamic Stability

9. These tests consisted of evaluating both the short-term and long-term responses of the aircraft. The tests were performed with the directional stability augmentation system (SAS) ON and OFF. Short-term response testing was accomplished by left and right directional control pulse inputs. The pulse input was obtained by rapidly displacing the control approximately 1 inch, holding for 0.5 second, then rapidly returning to the trim position and holding until aircraft motions were damped or recovery was required. All other controls remained fixed during forward flight tests. Trim conditions for low-speed dynamic stability tests were established as described under Low-speed Flight Characteristics, paragraph 13. Only the collective control remained fixed during low-speed dynamic stability tests.

10. Spiral stability was evaluated by stabilizing and trimming the aircraft in level unaccelerated flight. With lateral and collective fixed, a 5 degree bank angle left and right was established using directional control only. Once a bank angle was established, the directional controls were returned to the trimmed position and fixed while the resultant aircraft response was observed.

11. Long-term stick-fixed longitudinal stability characteristics were evaluated by displacing the aircraft from trim airspeed approximately 10 knots. The technique consisted of reducing airspeed below the trim value using cyclic control, then returning the cyclic control to the original trim position and observing the resulting aircraft response.

Controllability

12. Controllability tests were accomplished by applying left and right directional step inputs of up to 1 inch. The step input was made by rapidly displacing the control from trim, against the observer's foot. The input was rigidly held until a steady rate was obtained or recovery was necessary. A build-up of increasing step displacement was conducted. Collective control was held fixed. Hover and low-speed tests were conducted in winds of 5 knots or less at skid height of 10 feet.

Low-speed Flight Characteristics

13. Testing was accomplished using the ground pace vehicle method in winds of 5 knots or less. Tests were flown in not less than 5 knot increments from hover to 30 KTAS. All tests were conducted by stabilizing at a skid height of approximately 10 feet. The pace vehicle then established the desired speed using a calibrated fifth wheel for a reference ground speed. The test aircraft was flown in formation with the pace vehicle utilizing ground reference and horizontal situation indicator for heading stabilization. Data were recorded when the relative motion between the aircraft and pace vehicle was zero and the radar altimeter indicated no vertical displacement from the desired skid height.

14. Low-speed flight characteristics effects on yaw rates were accomplished by stabilizing on the 270 and 090 degree relative azimuths as described in paragraph 27. A left or right yaw up to 20 degrees/second was established; then, both collective and pedal controls were fixed while in the 120 to 240 degree relative azimuth region. Cyclic was used as necessary to maintain pace speed. Recovery from the yaw rate was initiated at the region boundary. Recovery was completed prior to passing the 360 degree relative azimuth.

Trim Changes With Power Effects

15. These tests were conducted by stabilizing the aircraft in a maximum power climb at the desired trim airspeed and sideslip with the SAS OFF. Collective control was gradually reduced while airspeed and sideslip were maintained until the rate of descent reached 1000 feet per minute.

Mission Maneuvers

16. Mission maneuvers were conducted in accordance with the OH-58 helicopter ATM (ref 11, app A).

APPENDIX E. TEST DATA

Figure	Figure Number
Control System Characteristics	E-1 through E-3
Static Lateral-Directional Stability	E-4 through E-9
Maneuvering Stability	E-10
Dynamic Stability	E-11 through E-151
Controllability	E-152 through E-157
Low-Speed Flight	E-158 through E-208
Trim Changes with Power Effects	E-209 through E-216
Mission Maneuvers	E-217 through E-254
Pitot-Static Calibration	E-255

FIGURE E-1
LIMITS OF CYCLIC CONTROL TRAVEL
JOH-58C USA S/N 70-15349

- NOTES: 1. ROTORS STATIC
2. CONTROL POSITION MEASURED AT CENTER OF GRIP
3. HYDRAULIC AND ELECTRICAL POWER PROVIDED BY
EXTERNAL POWER SOURCES
4. COLLECTIVE CONTROL FULL DOWN

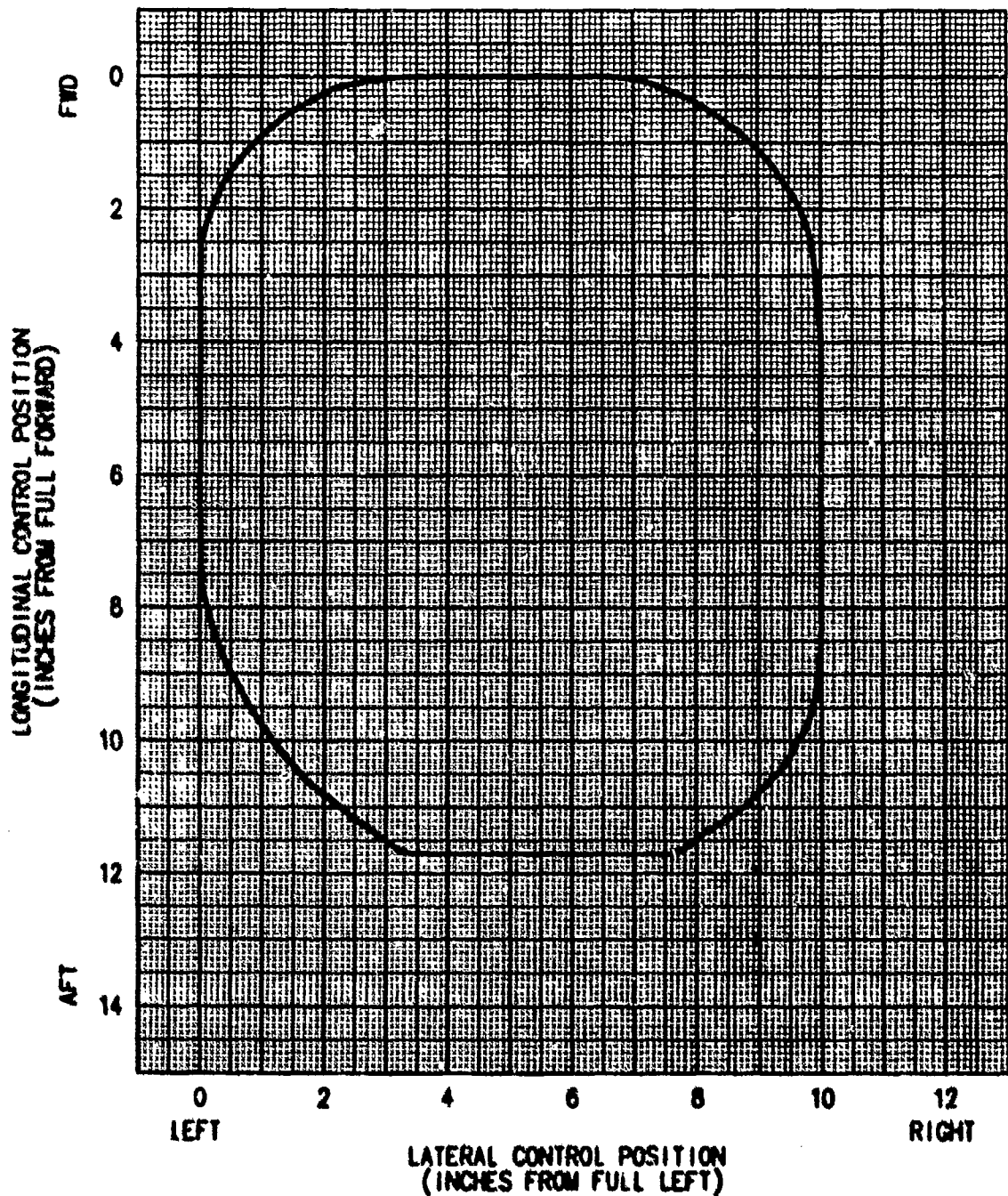


FIGURE E-2
LONGITUDINAL CONTROL SYSTEM CHARACTERISTICS
JOH-58C USA S/N 70-15349

- NOTES:
1. ROTORS STATIC
 2. FORCES AND POSITIONS MEASURED AT CENTER OF CONTROL GRIP
 3. HYDRAULIC AND ELECTRICAL POWER PROVIDED BY EXTERNAL POWER SOURCES
 4. HYDRAULIC SYSTEM ON
 5. STABILITY AUGMENTATION SYSTEM ON
 6. LATERAL CONTROL POSITION = 5.6 INCHES FROM FULL LEFT
 7. FORCE TRIM ON, ADJUSTABLE CYCLIC FRICTION OFF
 8. TOTAL LONGITUDINAL CONTROL TRAVEL = 11.7 INCHES

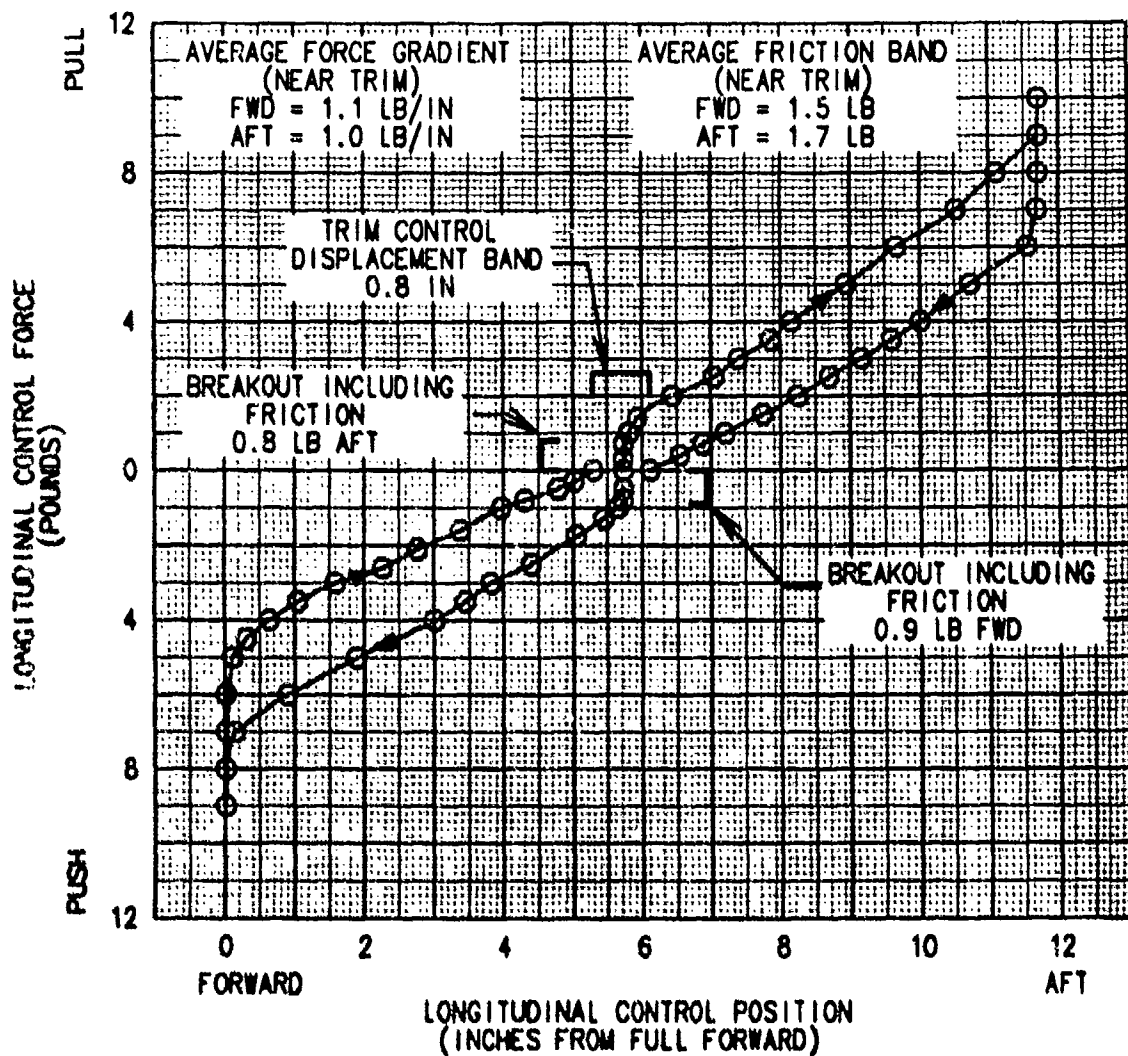


FIGURE E-3
LATERAL CONTROL SYSTEM CHARACTERISTICS
J0H-58C S/N 70-15349

- NOTES:
1. ROTORS STATIC
 2. FORCES AND POSITIONS MEASURED AT CENTER OF CONTROL GRIP
 3. HYDRAULIC AND ELECTRICAL POWER PROVIDED BY EXTERNAL POWER SOURCES
 4. HYDRAULIC SYSTEM ON
 5. STABILITY AUGMENTATION SYSTEM ON
 6. LONGITUDINAL CONTROL POSITION = 4.5 INCHES FROM FULL FORWARD
 7. FORCE TRIM ON, ADJUSTABLE CYCLIC FRICTION OFF
 8. TOTAL LATERAL CONTROL TRAVEL = 10.0 INCHES

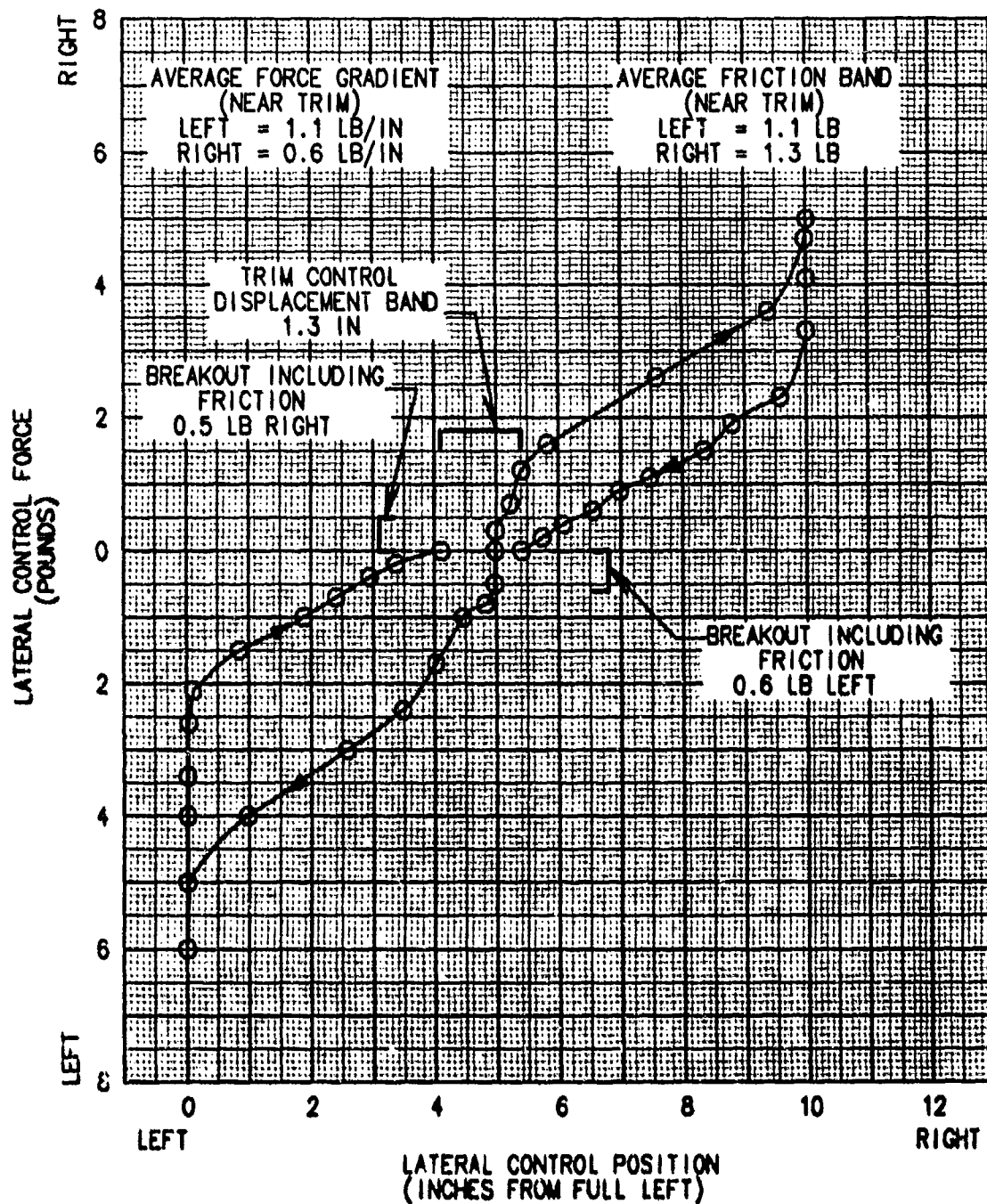


FIGURE E-4
STATIC LATERAL-DIRECTIONAL STABILITY
 JOH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	AVG CALIBRATED AIRSPEED (KNOTS)
LONG (FS)	LAT (BL)					
2910	107.9	0.1 LT	6160	19.0	355	97

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
 2. LEVEL FLIGHT
 3. SHADED SYMBOL DENOTES TRIM

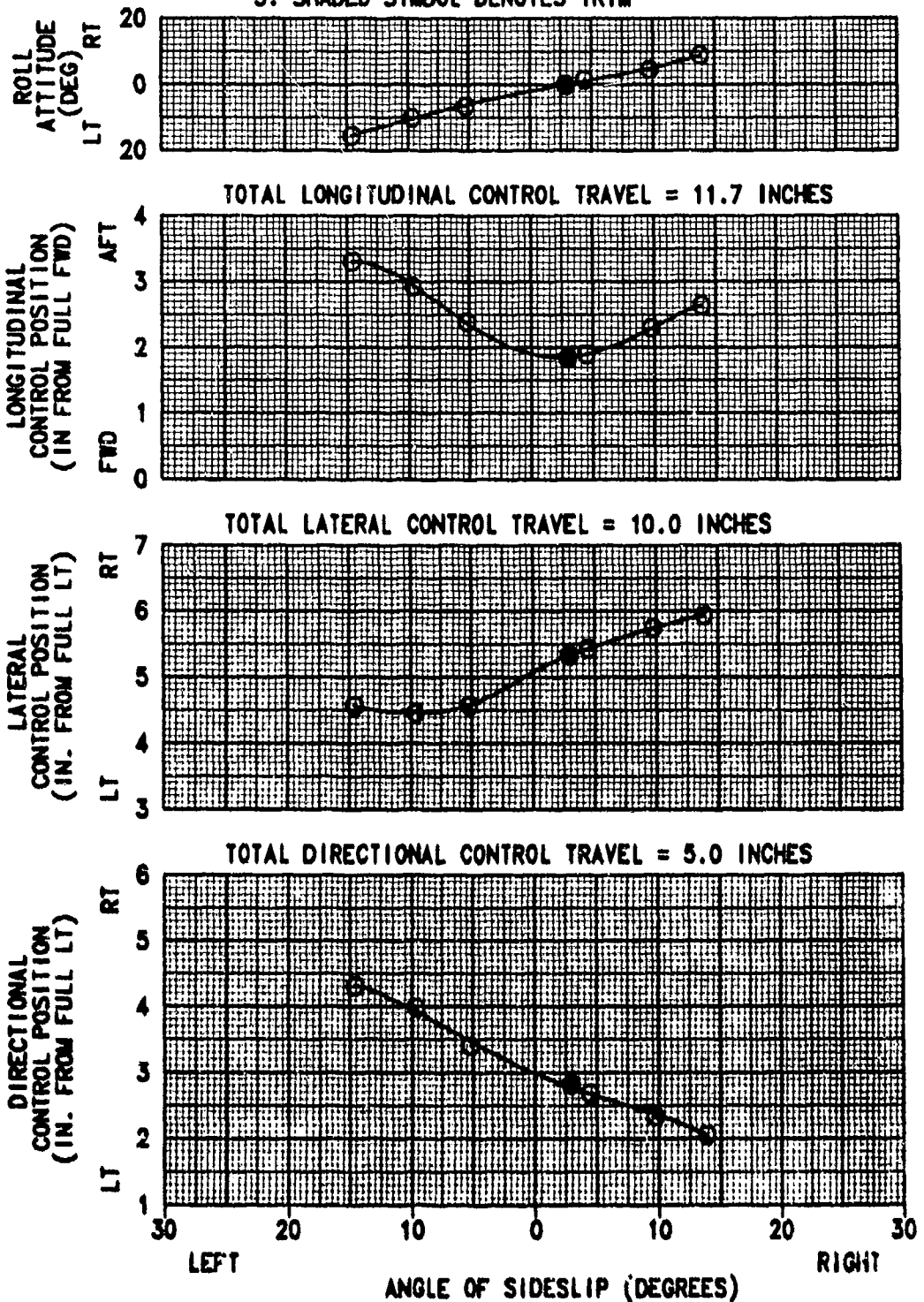
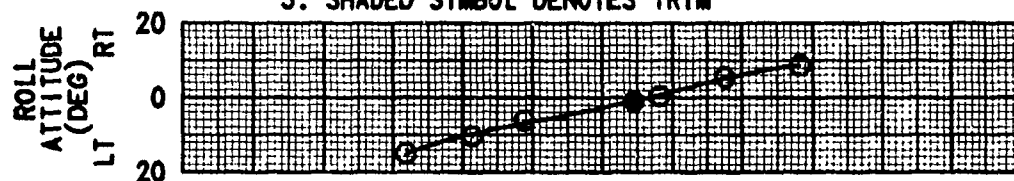


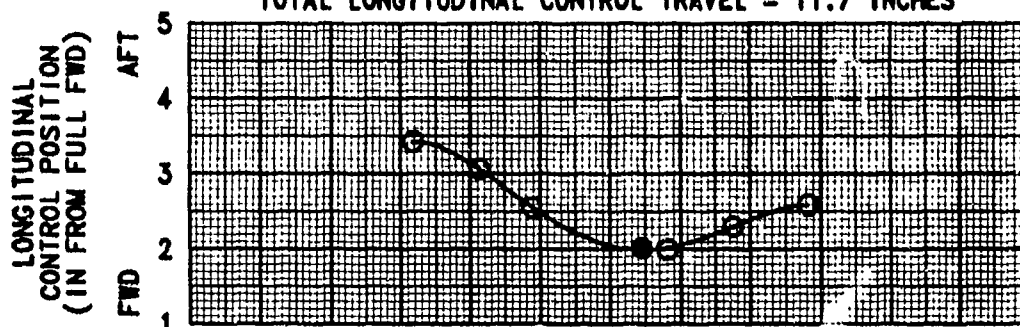
FIGURE E-5
STATIC LATERAL-DIRECTIONAL STABILITY
JOH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	AVG CALIBRATED AIRSPEED (KNOTS)
2870	LONG (FS)	LAT (BL)	6270	18.5	354	95
	107.8	0.1 LT				

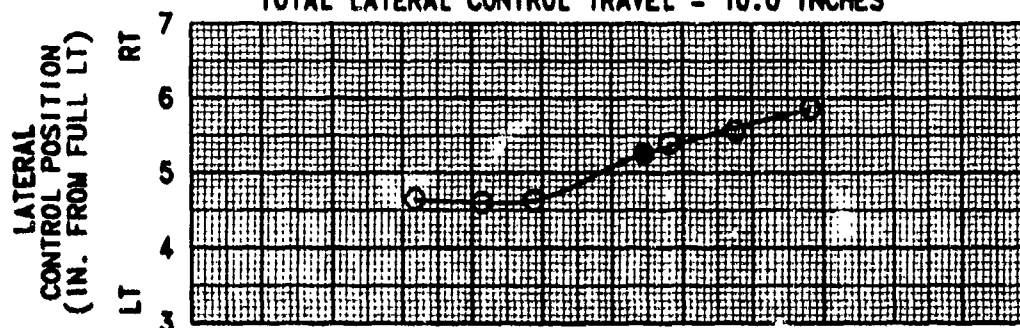
NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
 2. LEVEL FLIGHT
 3. SHADED SYMBOL DENOTES TRIM



TOTAL LONGITUDINAL CONTROL TRAVEL = 11.7 INCHES



TOTAL LATERAL CONTROL TRAVEL = 10.0 INCHES



TOTAL DIRECTIONAL CONTROL TRAVEL = 5.0 INCHES

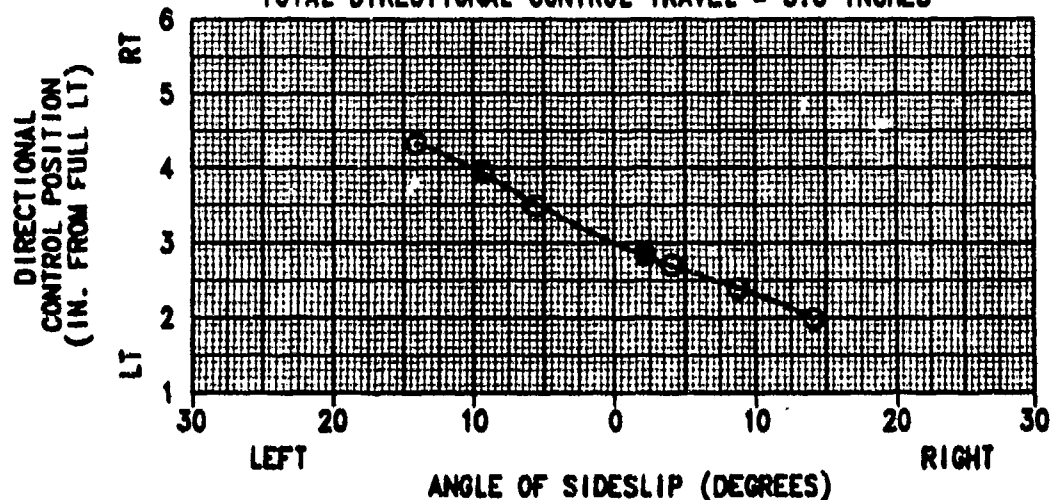


FIGURE E-6
STATIC LATERAL-DIRECTIONAL STABILITY
 JOH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	AVG CALIBRATED AIRSPEED (KNOTS)
	LONG (FS)	LAT (BL)				
2980	108.2	0.1 LT	6030	18.0	355	63

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
 2. LEVEL FLIGHT
 3. SHADED SYMBOL DENOTES TRIM

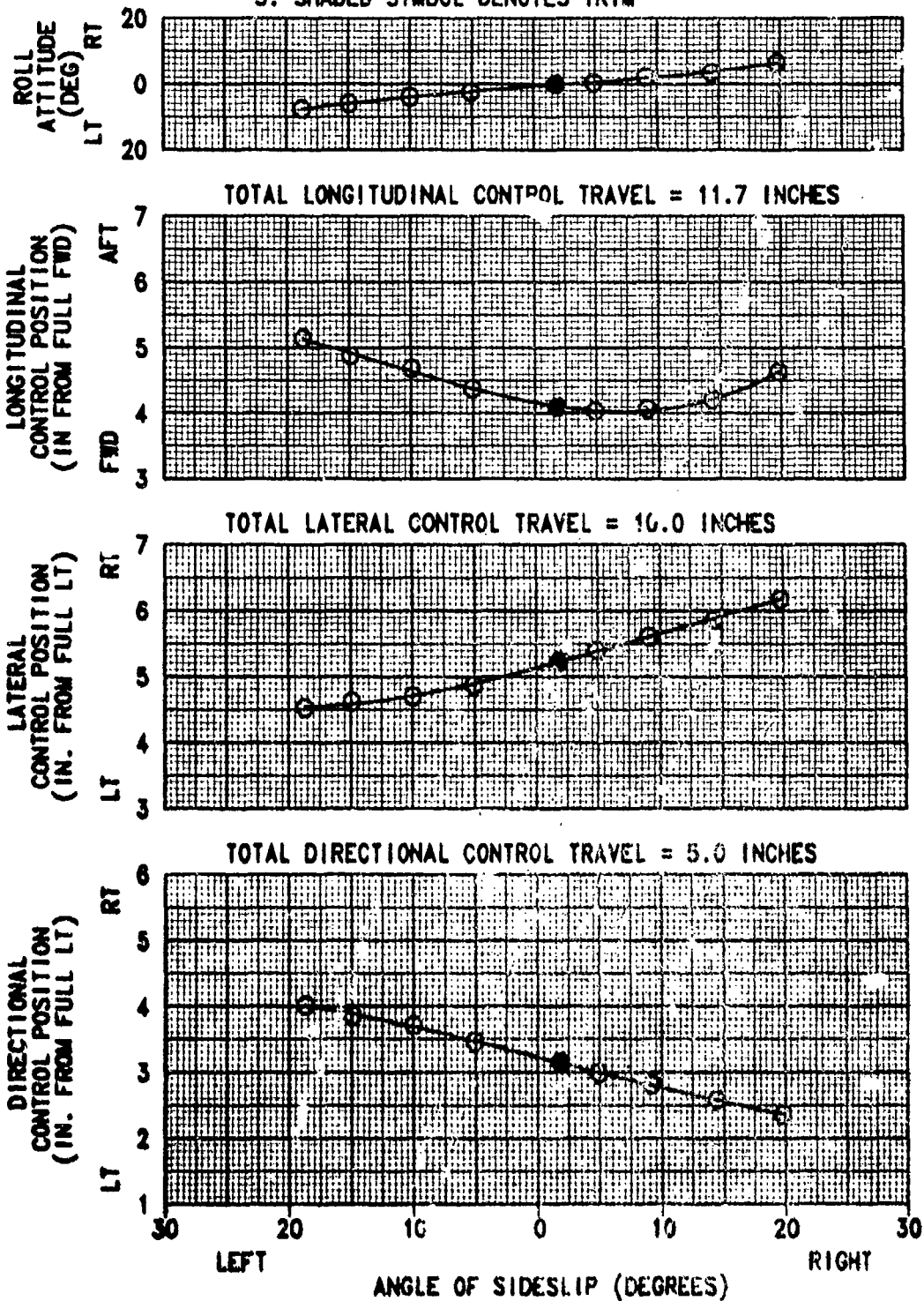


FIGURE E-7
STATIC LATERAL-DIRECTIONAL STABILITY
 JOH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	AVG CALIBRATED AIRSPEED (KNOTS)
	LONG (FS)	LAT (BL)				
2960	108.1	0.1 LT	5970	18.0	354	63

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
 2. LEVEL FLIGHT
 3. SHADED SYMBOL DENOTES TRIM

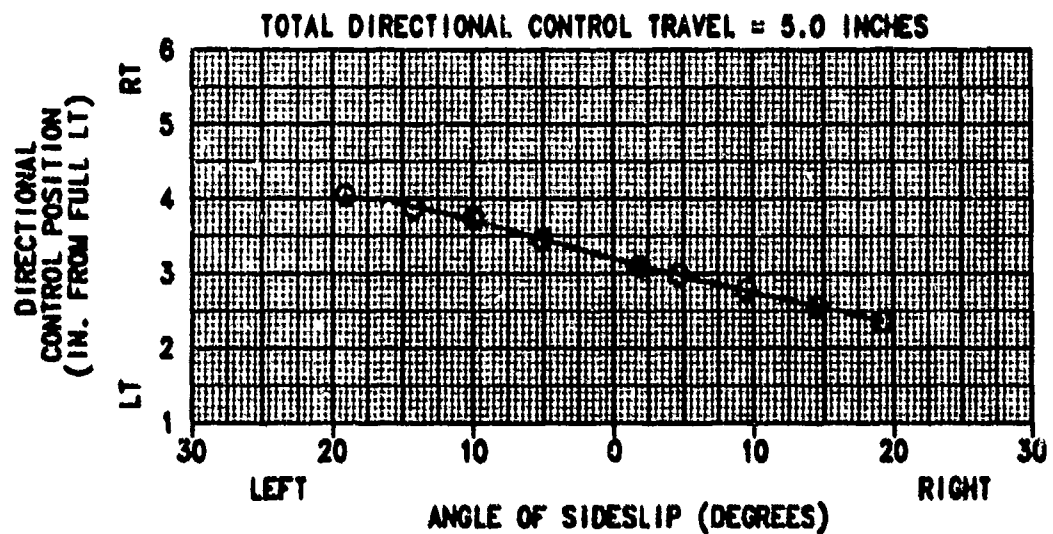
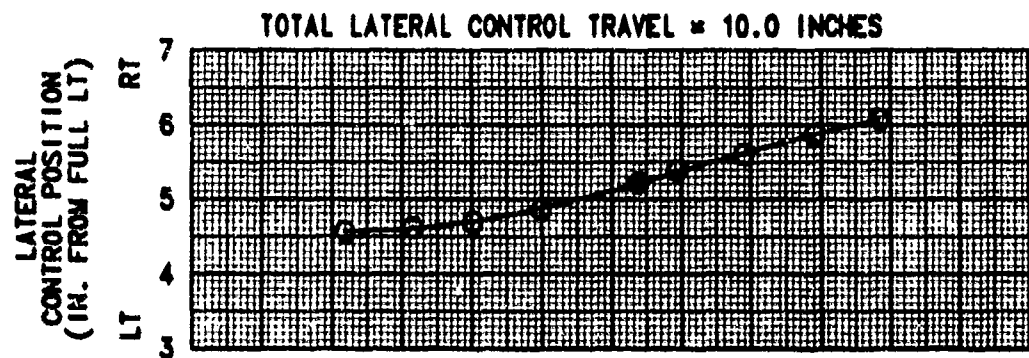
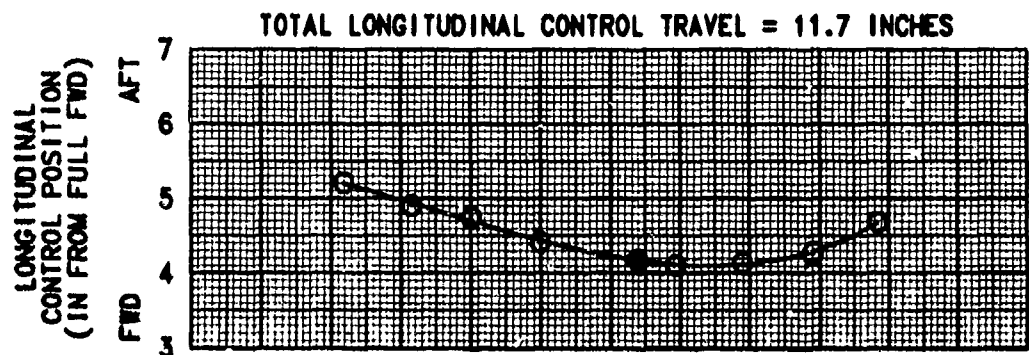
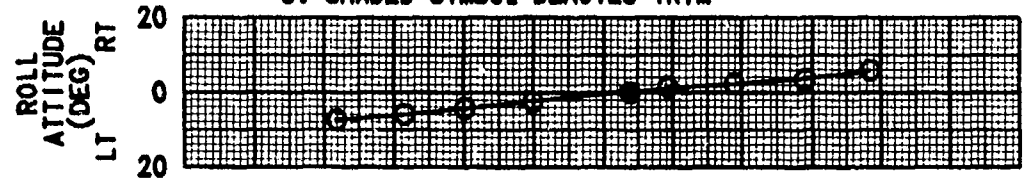


FIGURE E-8
STATIC LATERAL-DIRECTIONAL STABILITY IN CLIMBING FLIGHT
JOH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	AVG CALIBRATED AIRSPEED (KNOTS)
	LONG (FS)	LAT (BL)				
2820	107.7	0.1 LT	6330	19.0	354	64

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
 2. MRP CLIMB
 3. SHADED SYMBOL DENOTES TRIM

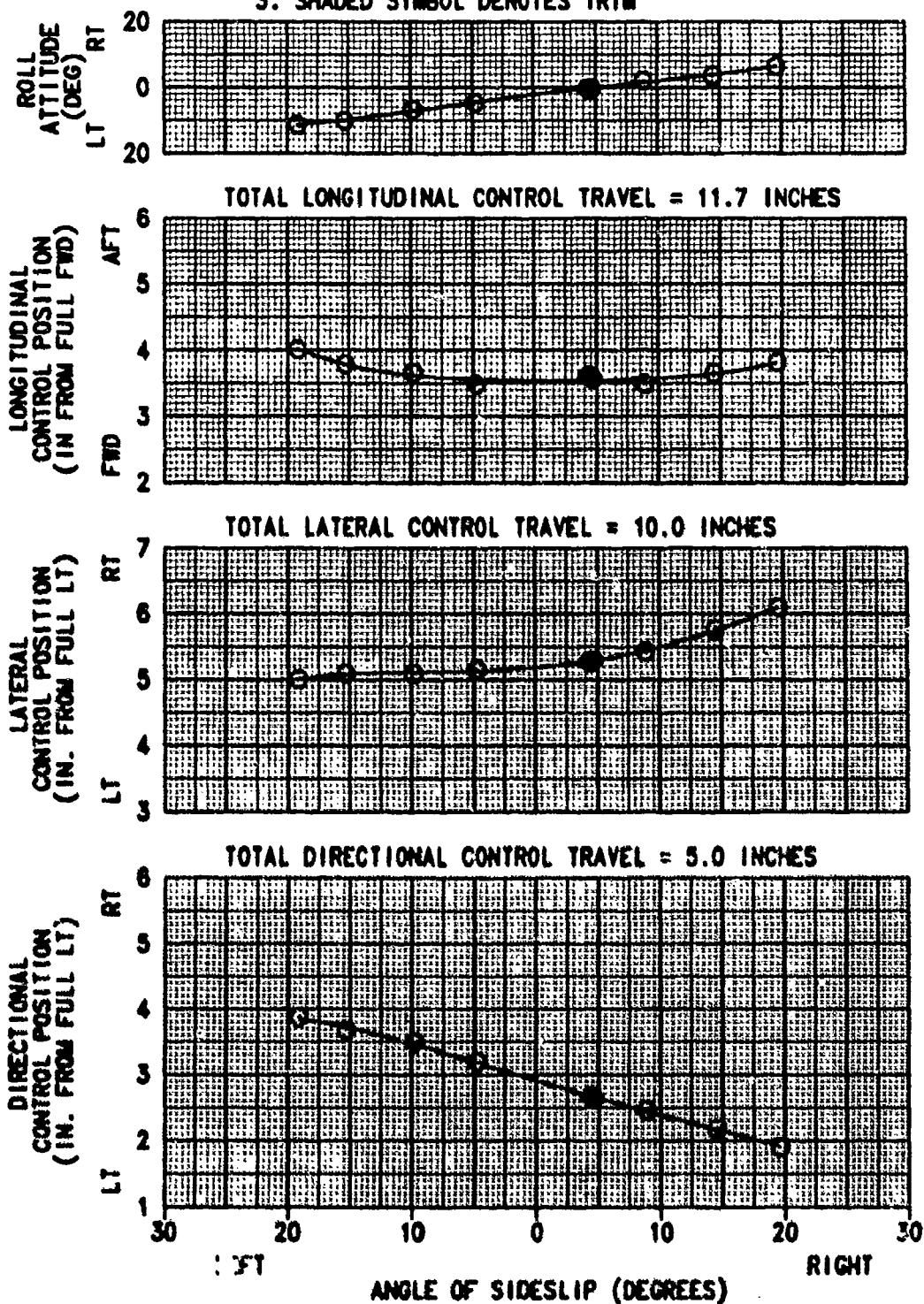


FIGURE E-9
STATIC LATERAL-DIRECTIONAL STABILITY IN AUTOROTATIONAL FLIGHT
JOH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	AVG CALIBRATED AIRSPEED (KNOTS)
2810	LONG (FS)	LAT (BL)	5900	20.0	349	62
	107.7	0.1 LT				

NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
 2. AUTOROTATION
 3. SHADED SYMBOL DENOTES TRIM

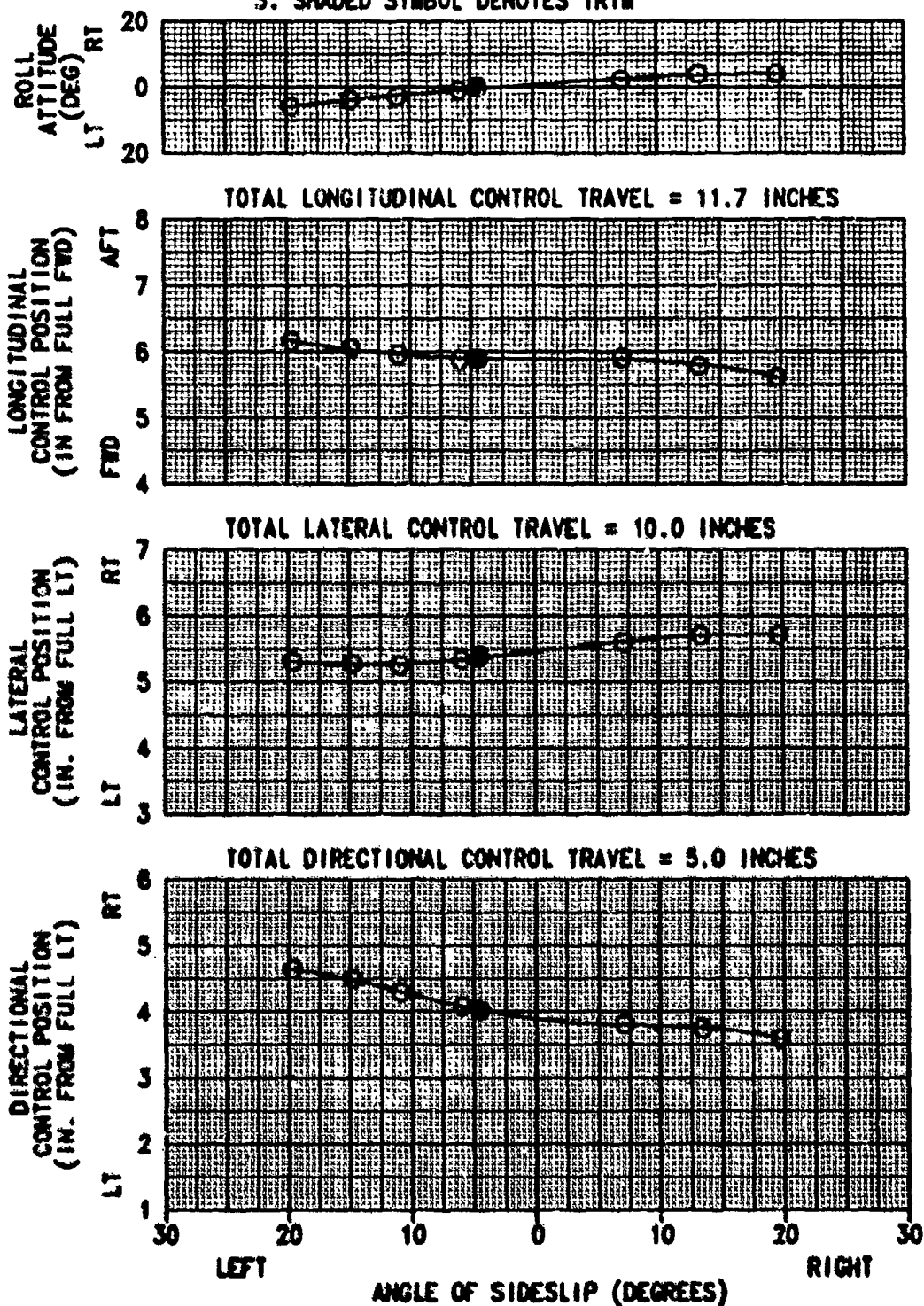


FIGURE E-10
MANEUVERING STABILITY
JOH-58C S/N 70-15349

SYM	AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	AVG CALIBRATED AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
		LONG (FS)	LAT (BL)					
○	2990	107.7	0.0	6690	21.0	355	64	ON
□	2930	107.5	0.0	6610	21.5	355	63	OFF

NOTE: 1. CLEAN CONFIGURATION, DOORS ON
2. SHADED SYMBOLS DENOTE TRIM,
OPEN SYMBOLS DENOTE LEFT TURN,
CROSSED SYMBOLS DENOTE RIGHT TURN

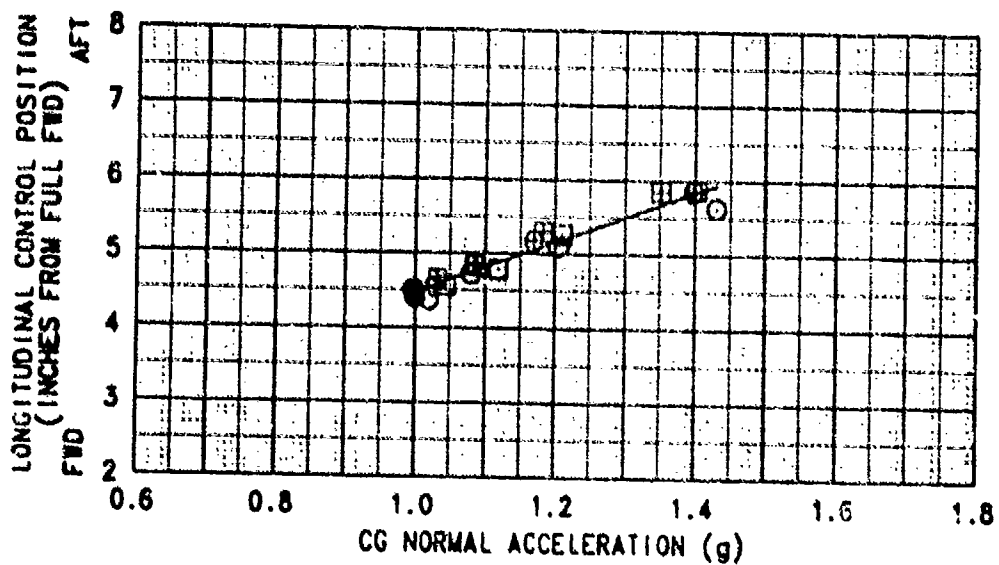
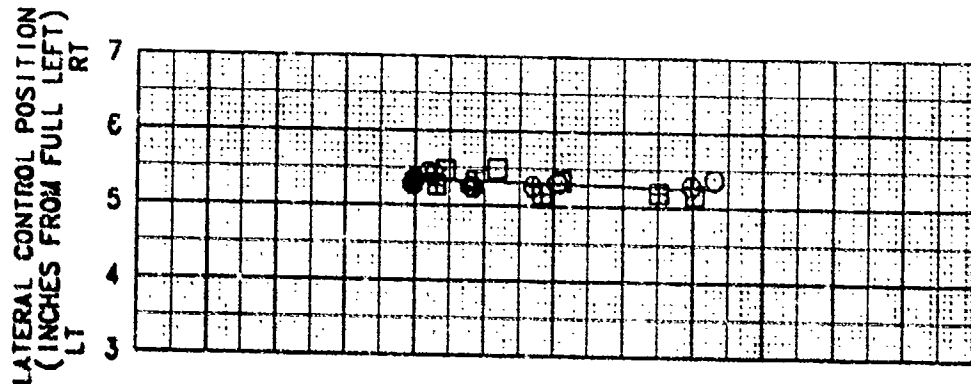


FIGURE E-11
LEFT DIRECTIONAL PULSE INPUT

JOM-SBC USA S/N 70-15349
 TRIM CALIBRATED AIRSPEED (KNOTS) 99
 STABILITY AUGMENTATION SYSTEM ON
 TRIM ROTOR SPEED (RPM) 354
 AVG DENSITY ALT (DEG C) 19.0
 AVG ALTITUDE (FEET) 8000
 AVG CS LAT (IN) 0.117
 AVG LONG (PS) 107.9
 AVG CROSS WEIGHT (LB) 2820

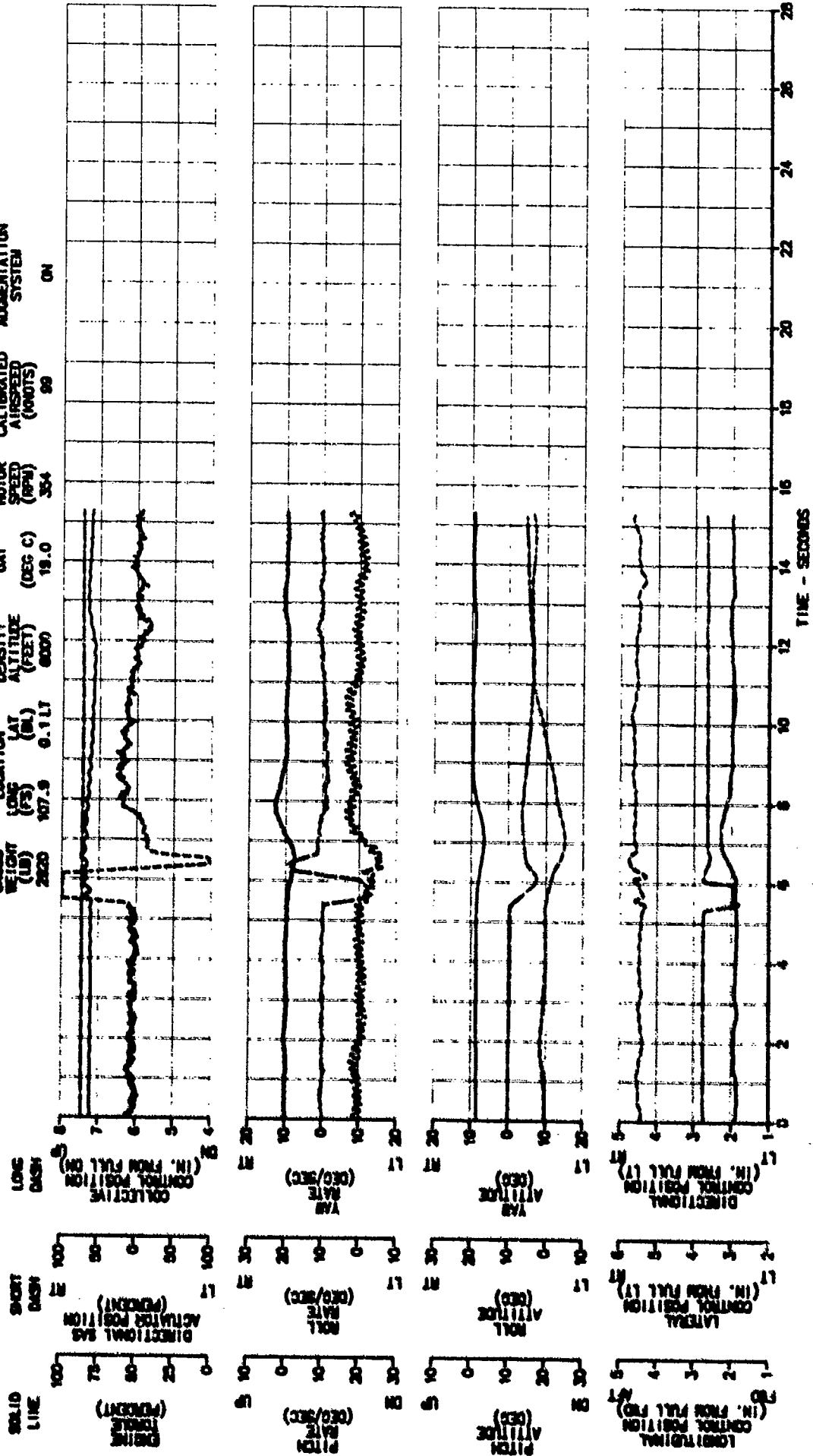


FIGURE E-12
LEFT DIRECTIONAL PULSE INPUT

JOH-55C USA S/N 70-15349
AVG CROSS WIND (KTS) 2000
AVG LOCATION LONG (FS) 127.9 LAT (ML) 0.1 LT
AVG DENSITY ALTITUDE (FEET) 5000
AVG ROTOR SPEED (RPM) 354
TRIM CALIBRATED AIRSPEED (KNOTS) 104
STABILITY AUGMENTATION SYSTEM OFF

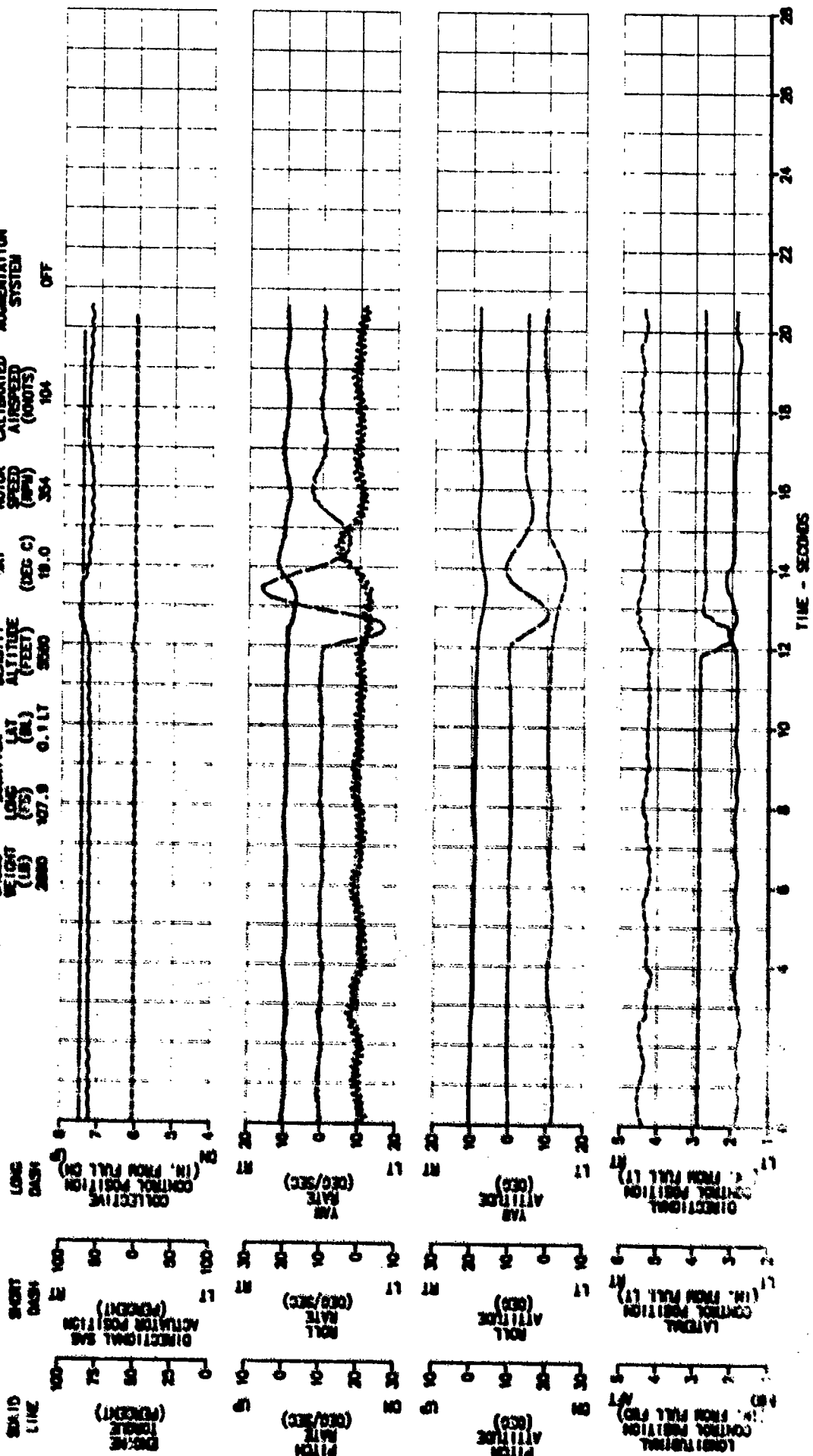


FIGURE E-13
RIGHT DIRECTIONAL PULSE INPUT

JOM-58C USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM
ON

TRIM
CALIBRATED
AIRSPEED
(KNOTS)
80

TRIM
MOTOR
SPEED
(RPM)
354

AVG
QAT
(DEG C)
18.0

AVG
DENSITY
ALTITUDE
(FEET)
8040

AVG
LOCATION
LAT
(DEG)
0.127

AVG
WEIGHT
(LB)
2220

AVG
WEIGHT
(LB)
2220

AVG
WEIGHT
(LB)
2220

AVG
WEIGHT
(LB)
2220

AVG
WEIGHT
(LB)
2220

AVG
WEIGHT
(LB)
2220

AVG
WEIGHT
(LB)
2220

AVG
WEIGHT
(LB)
2220

AVG
WEIGHT
(LB)
2220

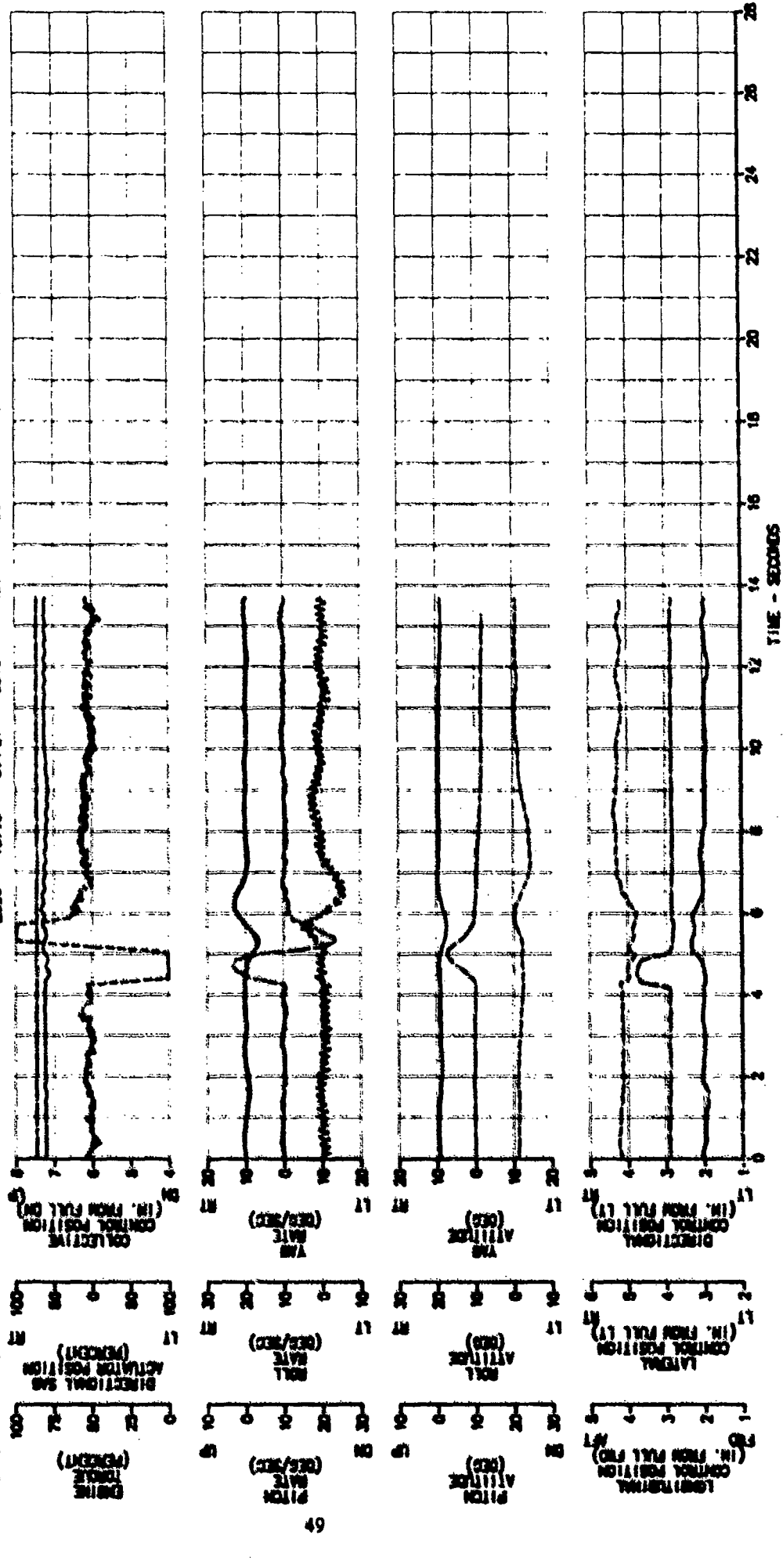


FIGURE E-14
RIGHT DIRECTIONAL PULSE INPUT

JOM-58C USA S/N 70-15349

AVG GROSS WEIGHT (LB) 2880
 AVG CC LOCATION LONG (FS) 107.9
 LAT (BL) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 5750
 QAT (DEG C) 19.5
 TRIM ROTOR SPEED (RPM) 354
 TRIM CALIBRATED AIRSPEED (KNOTS) 101
 STABILITY AUGMENTATION SYSTEM OFF

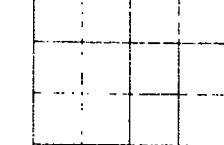
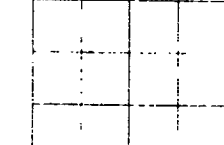
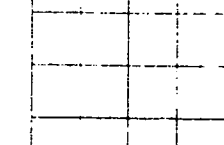
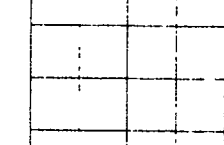
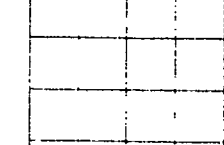
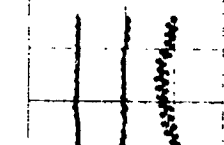
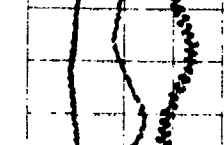
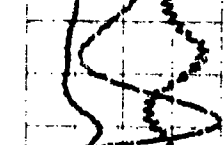
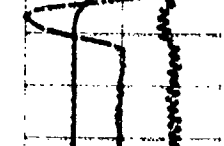
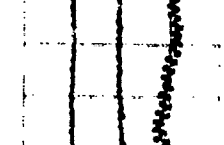
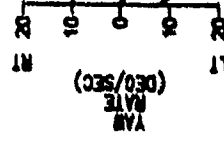
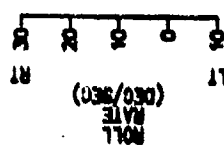
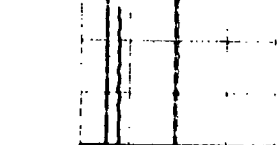
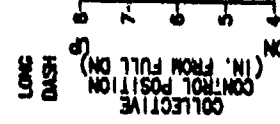
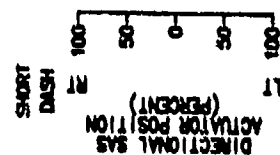
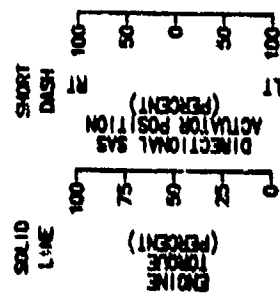


FIGURE E-15
LEFT DIRECTIONAL PULSE INPUT

J04-S0C USA S/N 70-15349

AVG CROSS WEIGHT (LB) 2880
AVG CS LOCATION LONG (75) 108.2 LAT (ML) 0.1 LT
AVG DENSITY ALTITUDE (FEET) 8020
AVG OAT (DEG C) 19.0
TRIM CALIBRATED AIRSPEED (KNOTS) 06
TRIM ROTOR SPEED (RPM) 304
STABILITY AUGMENTATION SYSTEM ON

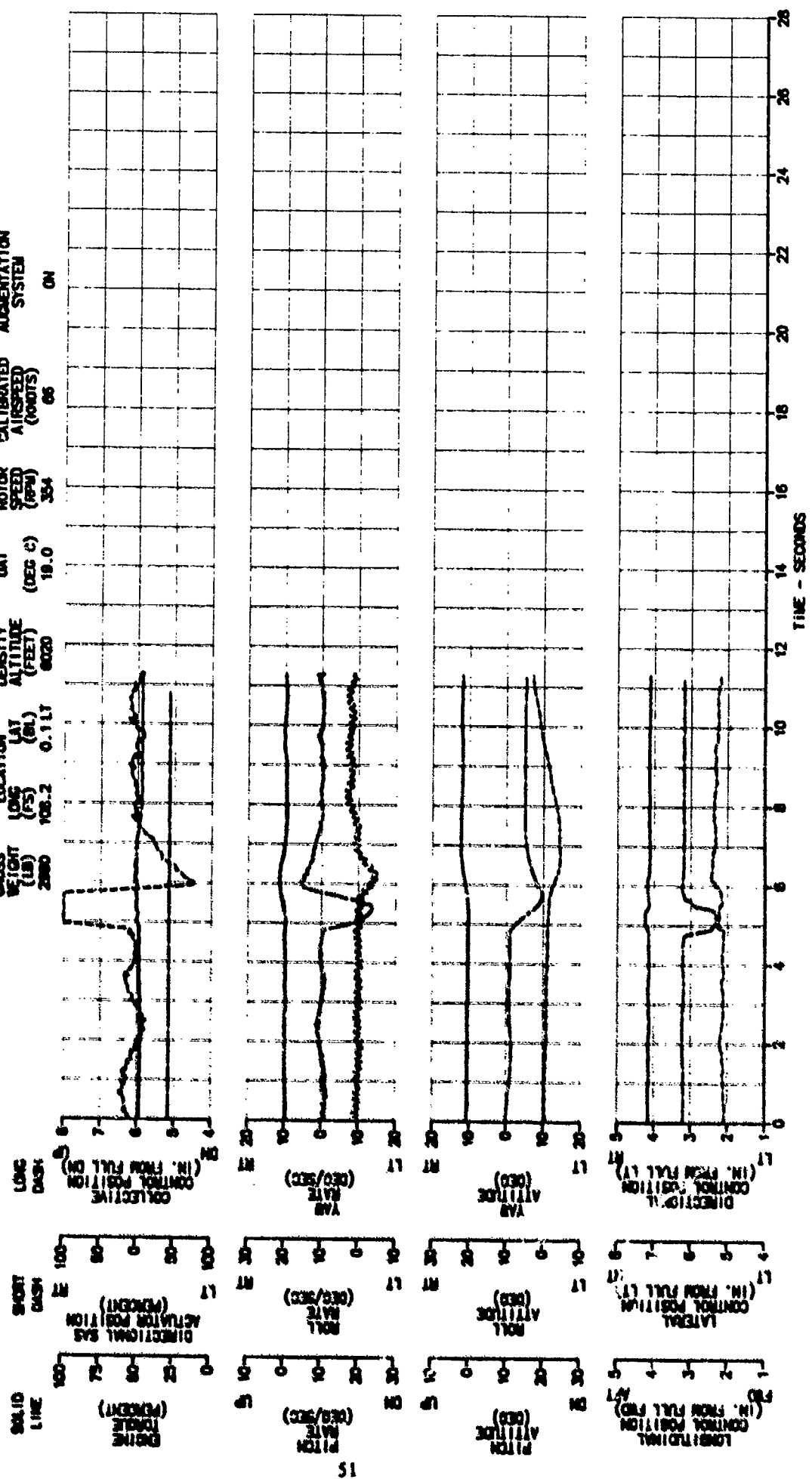
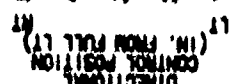
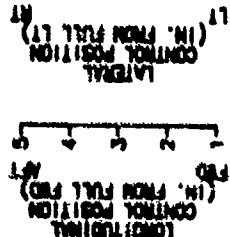
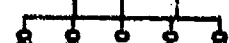
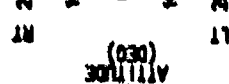
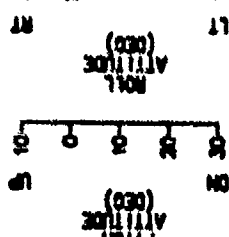
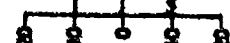
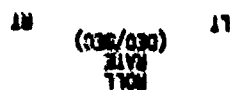
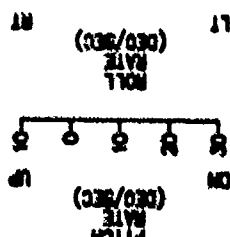
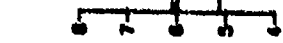
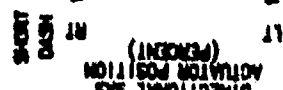
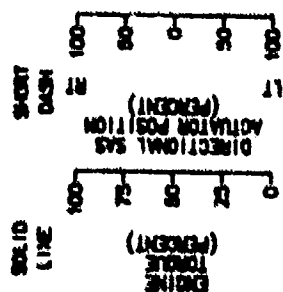


FIGURE E-16
LEFT DIRECTIONAL PULSE INPUT

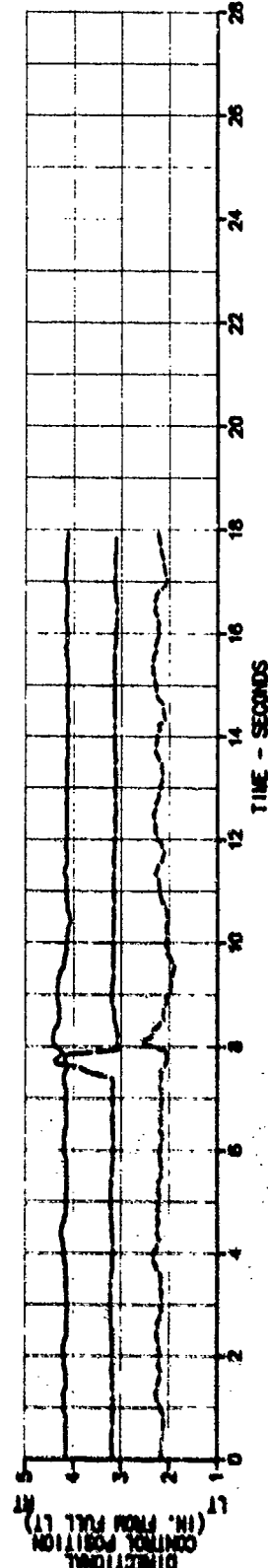
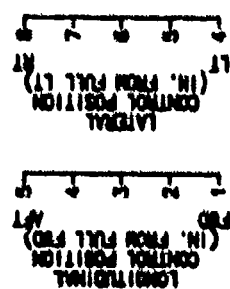
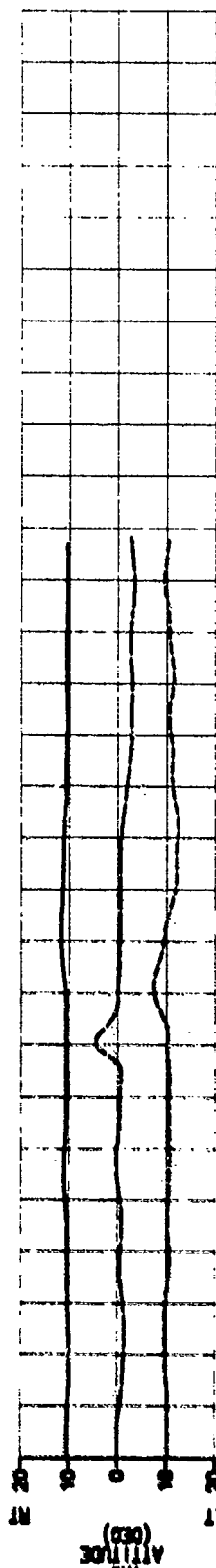
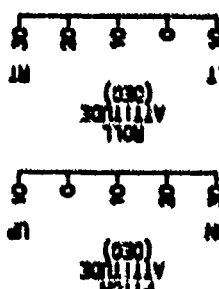
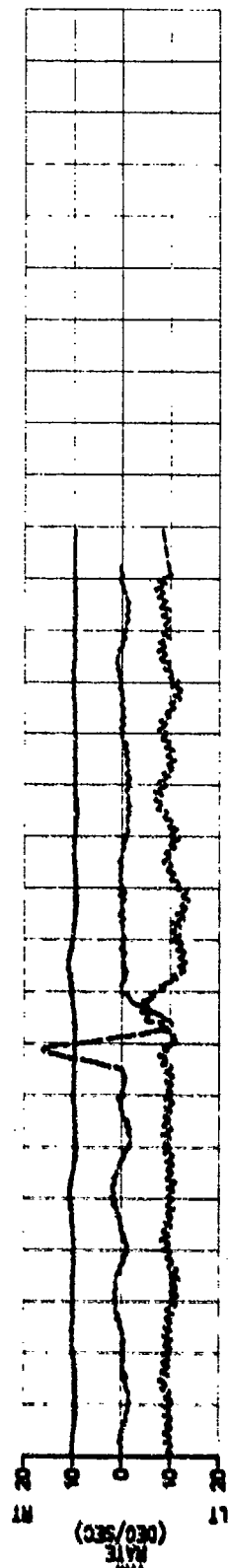
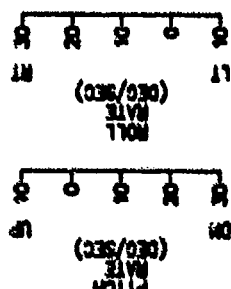
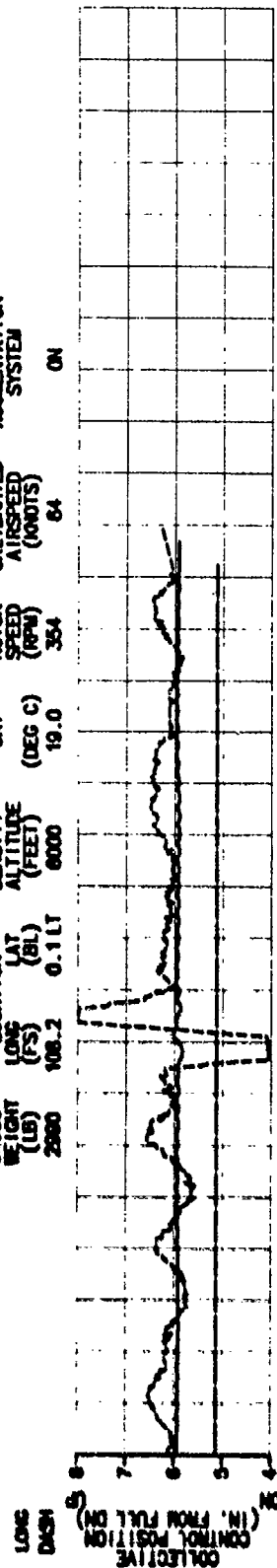
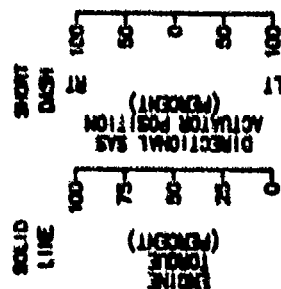
JOH-50C USA S/N 70-15349
 TRIM CALIBRATED AIRSPEED (KNOTS) 66
 TRIM ROTOR SPEED (RPM) 354
 STABILITY AUGMENTATION SYSTEM OFF
 AVG CROSS WEIGHT (LB) 2850
 AVG CS LOCATION (FS) 108.1
 LAT (DL) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 5740
 AVG QAT (DEG C) 18.5



TIME - SECONDS

FIGURE E-17
RIGHT DIRECTIONAL PULSE INPUT

JOH-50C USA S/N 70-15349
 TRIM CALIBRATED AIRSPEED (KNOTS) 84
 TRIM ROTOR SPEED (RPM) 354
 AVG DENSITY ALTITUDE (FEET) 8000
 AVG LOCATION LAT (BL) 0.1 LT
 LONG 108.2
 AVG GROSS WEIGHT (LB) 2880
 STABILITY AUGMENTATION SYSTEM ON



TIME - SECONDS

FIGURE E-18
RIGHT DIRECTIONAL PULSE INPUT

JOH-50C USA S/N 70-15349

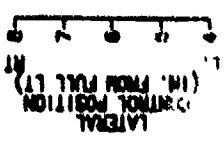
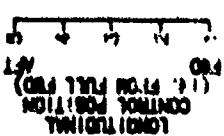
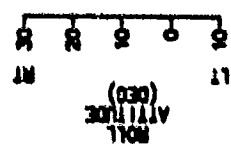
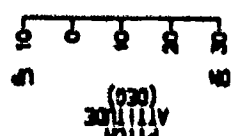
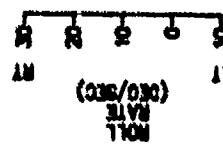
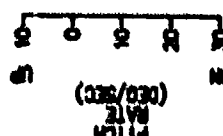
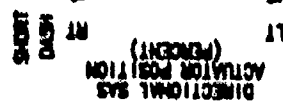
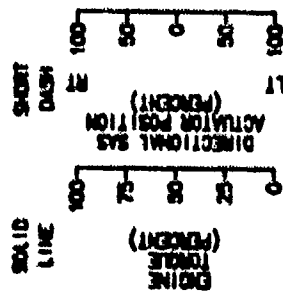
TRIM CALIBRATED AIRSPEED (KNOTS) 68
STABILITY AUGMENTATION SYSTEM OFF

TRIM ROTOR SPEED (RPM) 354
AVG OAT (DEG C) 18.0

AVG DENSITY ALTITUDE (FEET) 5710

AVG CS LOCATION LONG (FS) 108.0 LAT (BL) 0.1 LT

AVG GROSS WEIGHT (LB) 2850



TIME - SECONDS

FIGURE E-19
LEFT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH

J04-50C USA S/N 70-15346

AVG GROSS WEIGHT (LB)	2000	AVG LOCATION LONG (FS)	108.2	AVG CO LAT (BL)	0.1 LT	AVG DENSITY ALTITUDE (FEET)	-3050	AVG DAY (DEG C)	19.0	TRIM ROTOR SPEED (RPM)	351	TRUE AIRSPEED (KNOTS)	0	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	------------------------	-------	-----------------	--------	-----------------------------	-------	-----------------	------	------------------------	-----	-----------------------	---	-------------------------------	----

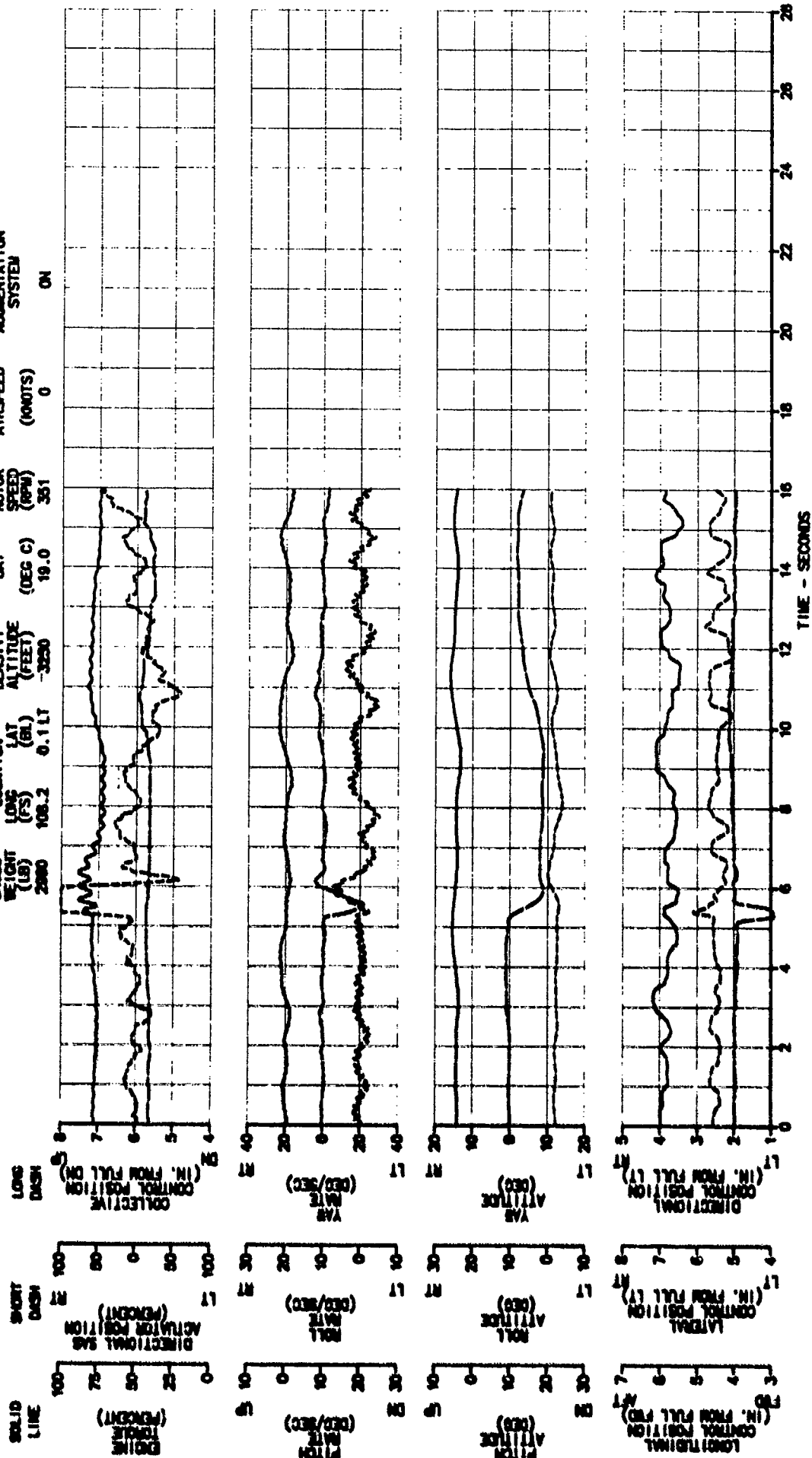


FIGURE E-20
LEFT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH
JOM-88C USA S/N 70-15349

AVG CROSS WEIGHT (LB) 2970
AVG CS LONG (FS) 108.1
AVG CS LAT (BL) 0.1 LT
AVG DENSITY ALTITUDE (FEET) 3240
AVG OAT (DEG C) 19.0
TRIM ROTOR SPEED (RPM) 351
TRUE AIRSPEED (KNOTS) 0
STABILITY AUGMENTATION SYSTEM OFF

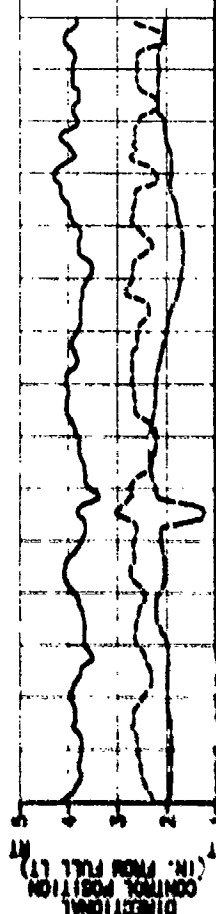
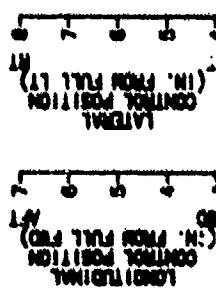
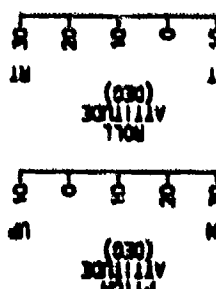
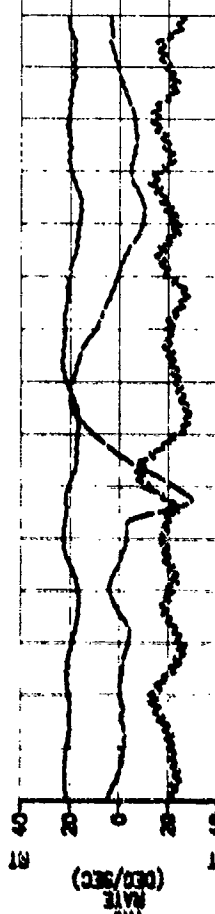
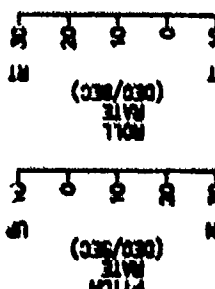
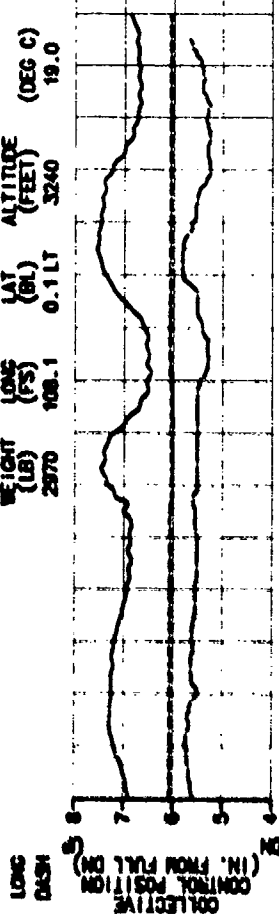
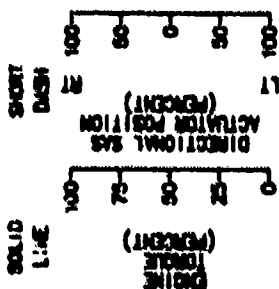


FIGURE E-21
RIGHT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH

JOM-58C USA S/N 70-15348

AVG CROSS WEIGHT (LB)	2870	AVG CO LOCATION (FS)	108.1	AVG ALTITUDE (FEET)	3230	AVG GAT (DEG C)	19.0	TRIM ROTOR SPEED (RPM)	351	TRUE AIRSPEED (KNOTS)	0	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	----------------------	-------	---------------------	------	-----------------	------	------------------------	-----	-----------------------	---	-------------------------------	----

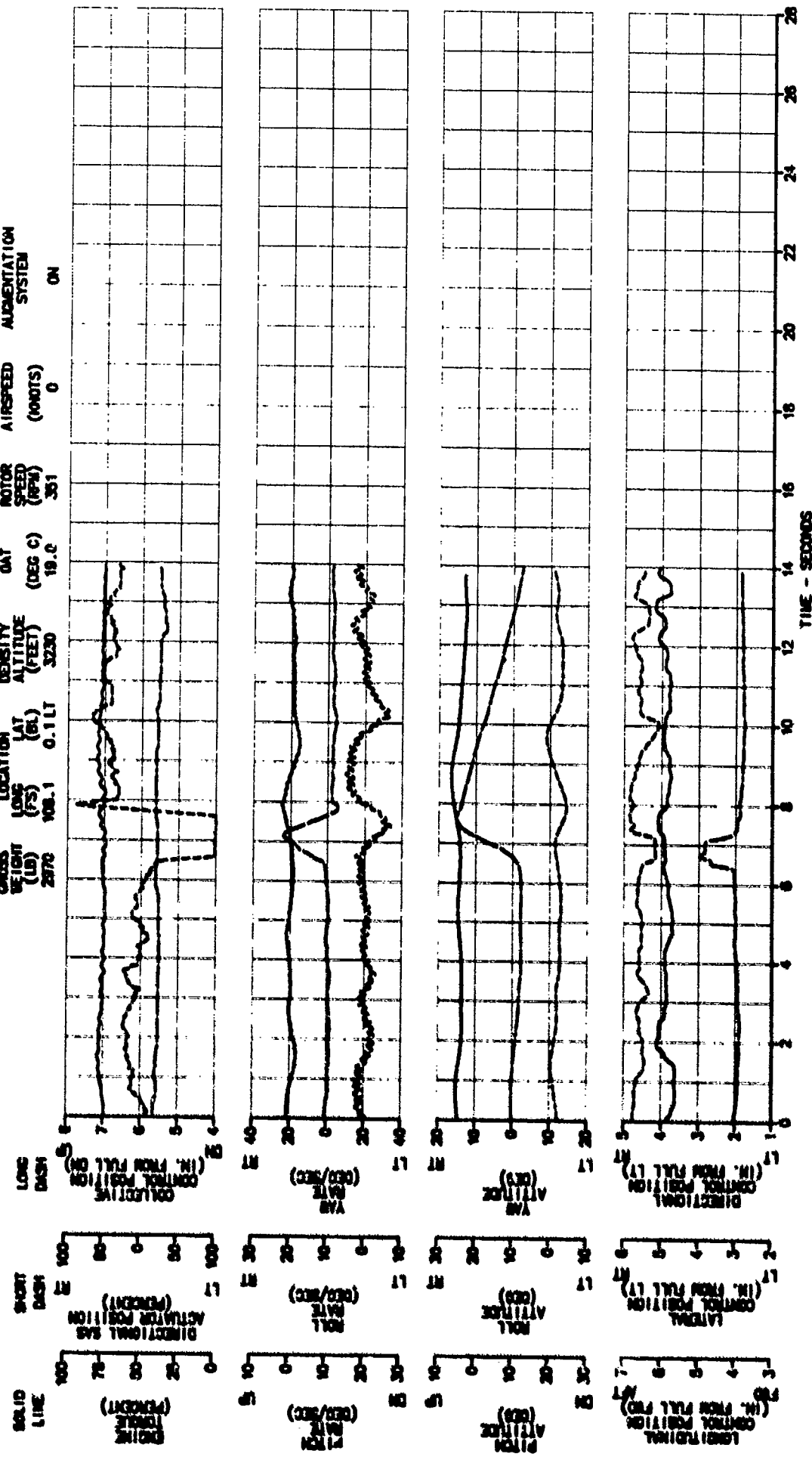
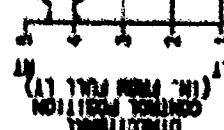
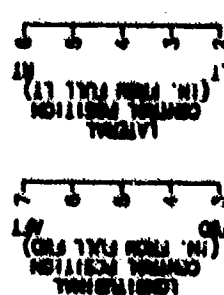
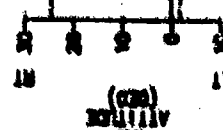
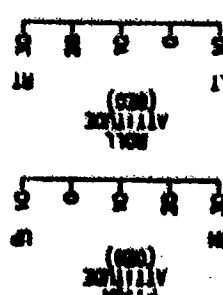
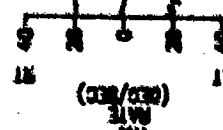
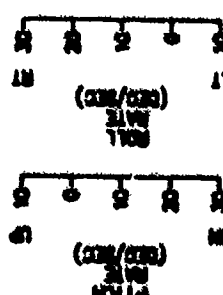
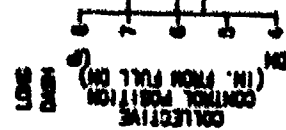
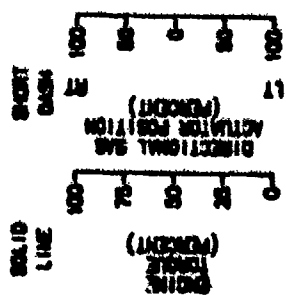


FIGURE E-22
RIGHT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH
J01-SMC USA S/N 70-15340

AVG CROSS WEIGHT (LB) 2070
 AVG CG LONG (PS) 103.1
 AVG CG LAT (ML) 0.1 LT
 AVG DENSITY GAT (DEG C) 19.0
 TRIM MOTOR SPEED (RPM) 352
 TRUE AIRSPEED (KNOTS) 0
 STABILITY AUGMENTATION SYSTEM OFF



TIME - SECONDS

FIGURE E-23
LEFT DIRECTIONAL PULSE INPUT - 080 DEGREE AZIMUTH

JOM-SBC USA S/N 70-15346

AVG CRDS WEIGHT (LB)	AVG CR LOCATION (PS)	AVG CR LAT (DL)	AVG DENSITY ALTITUDE (FEET)	AVG QAT (DEG C)	TRIM MOTOR SPEED (RPM)	TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
3008	107.7	0.117	3300	20.0	300	8	ON

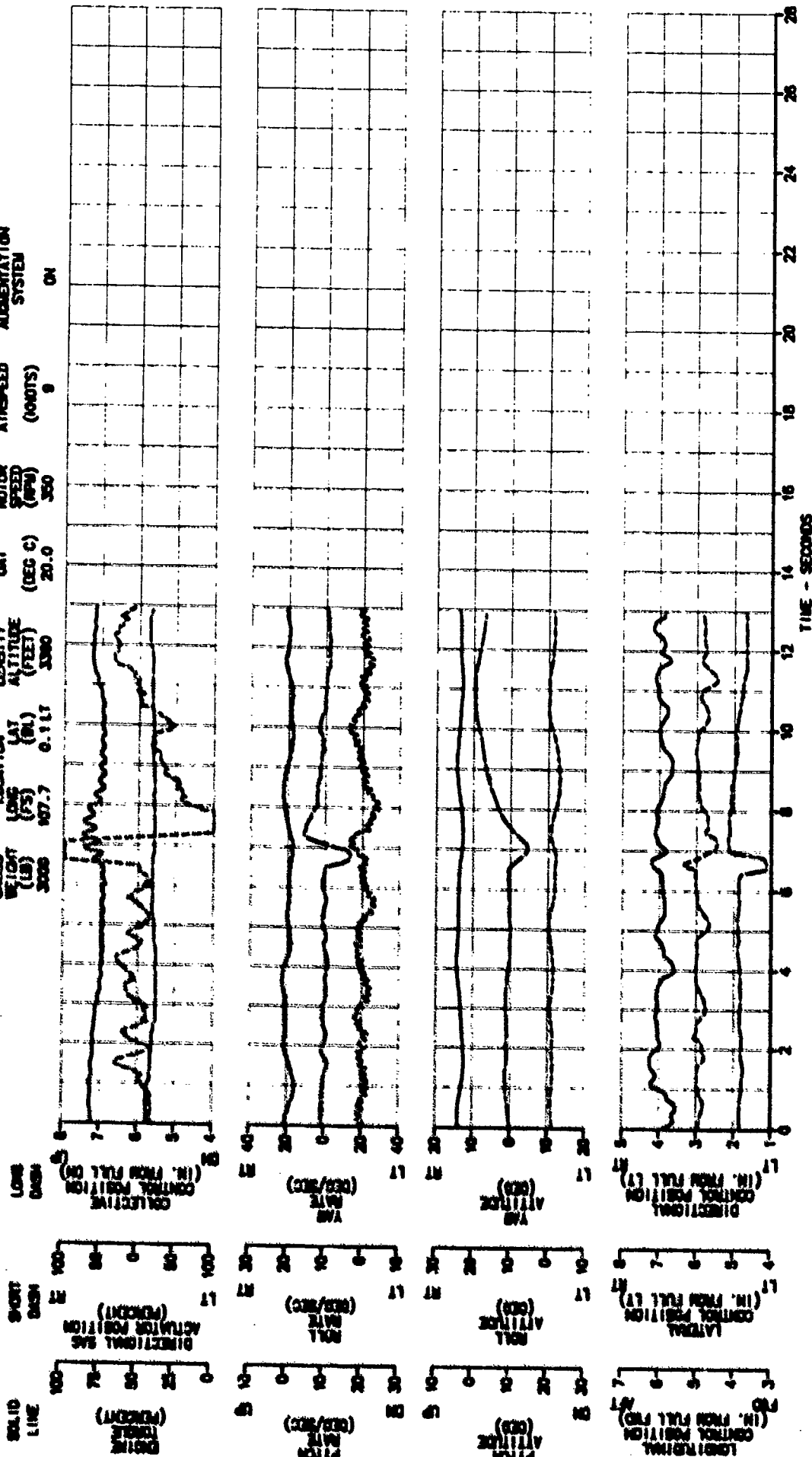


FIGURE E-24
LEFT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH

JOH-SEC USA S/N 70-15349
 TRUE AIRSPEED (KNOTS) 9
 STABILITY AUGMENTATION SYSTEM OFF
 TRIM MOTOR SPEED (RPM) 351
 AVG DENSITY ALT (DEG C) 20.0
 AVG ALTITUDE (FEET) 3360
 AVG CS LONG (FS) 0.1 LT
 AVG WEIGHT (LB) 2880
 107.6

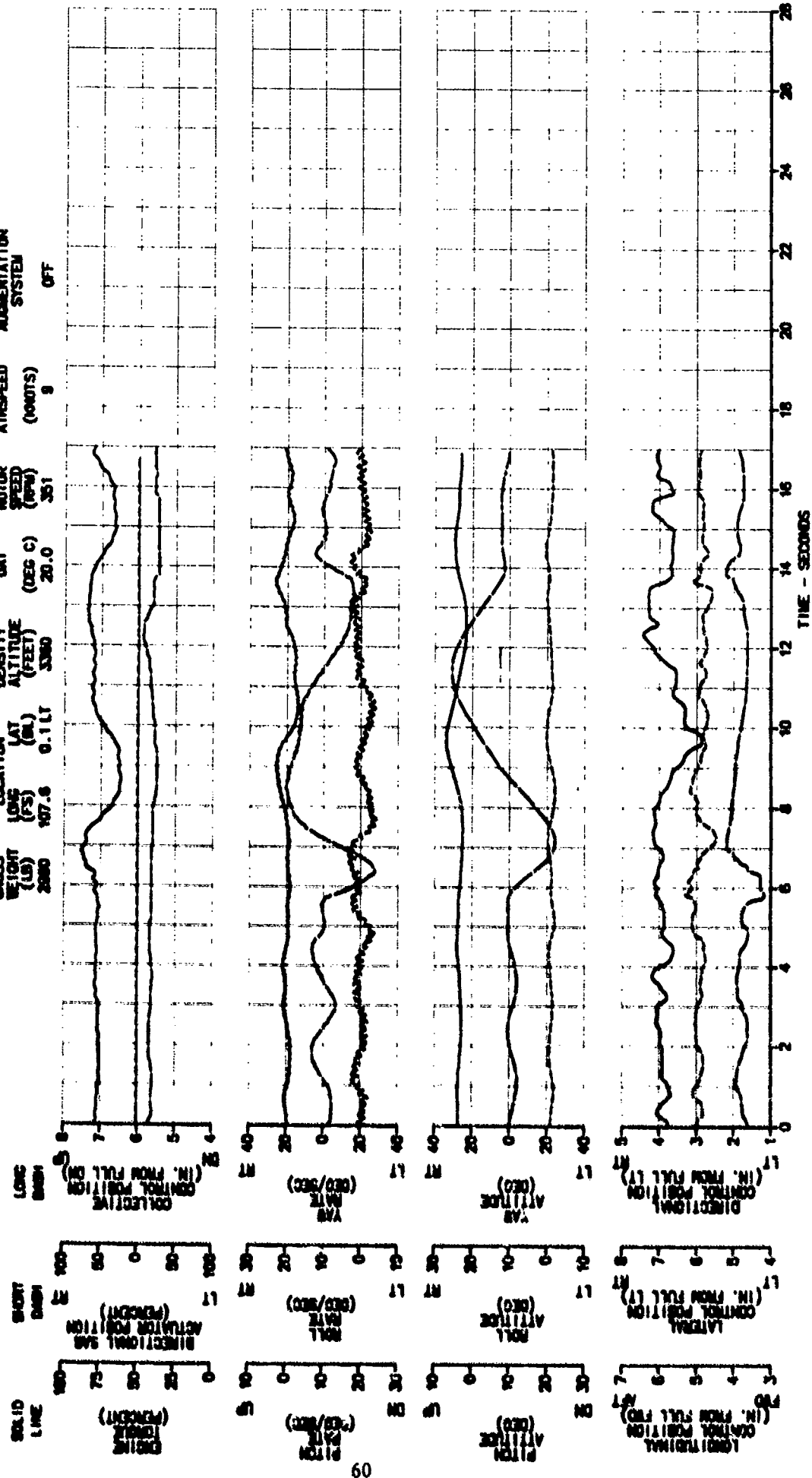


FIGURE E-25
RIGHT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH

JOH-08C USA S/N 70-15346
 TRUE AIRSPEED (KNOTS) 9
 STABILITY AUGMENTATION SYSTEM ON
 TRIM MOTOR SPEED (RPM) 353
 AVG GAT (DEG C) 20.0
 AVG DENSITY ALTITUDE (FEET) 3370
 AVG CS LAT (ML) 0.1 LT
 AVG LONG (PS) 107.7
 AVG CROSS WEIGHT (LB) 3000

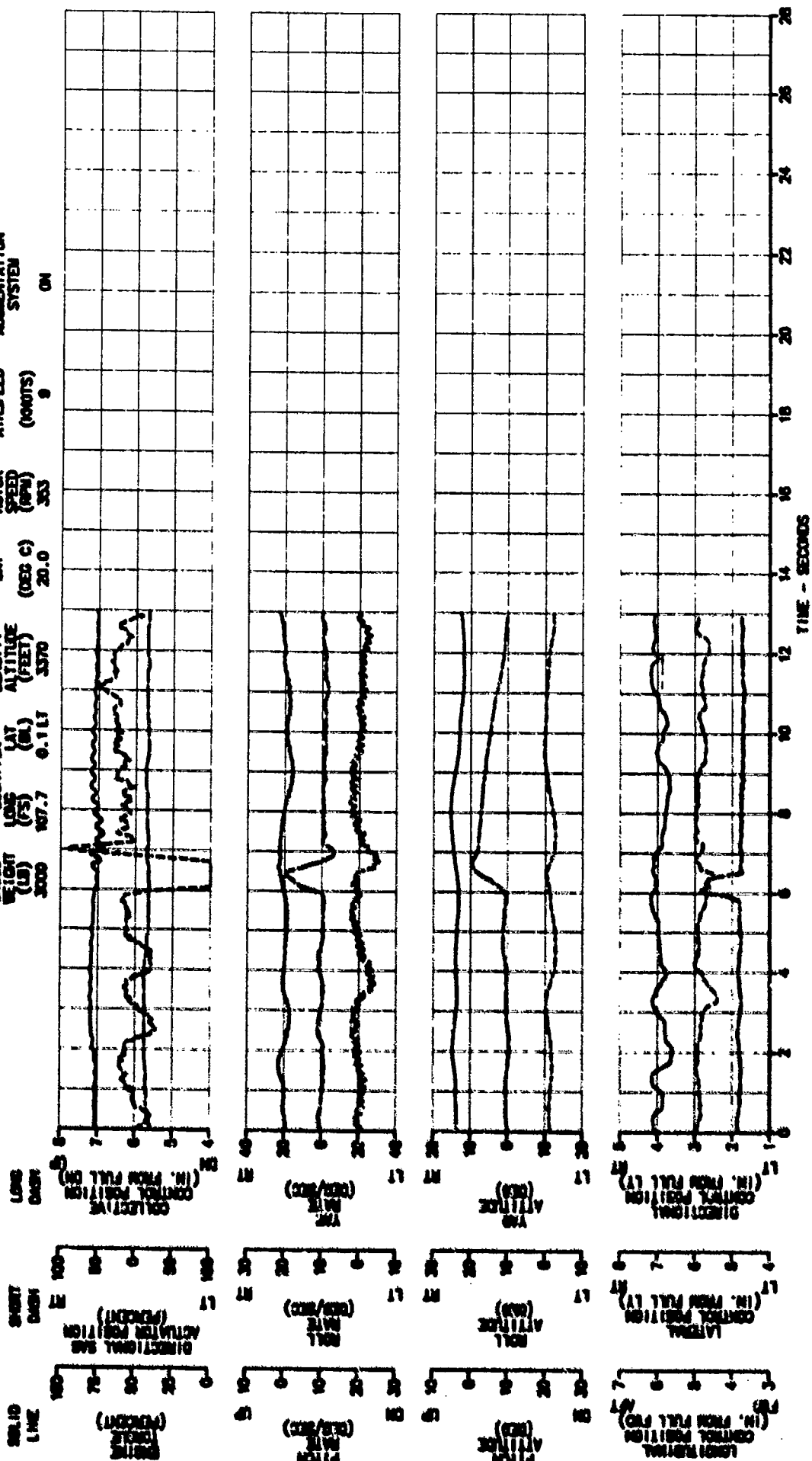


FIGURE E-28
RIGHT DIRECTIONAL PULSE INPUT - 080 DEGREE AZIMUTH

JAN-DEC LRA S/N 70-15349

AVG CS	AVG	TRIN	STABILITY
WEIGHT	QAT	ROTOR	AUGMENTATION
(LB)	(DEG C)	SPEED	SYSTEM
2000	20.5	304	OFF
107.5	0.117		
107.5	0.117		

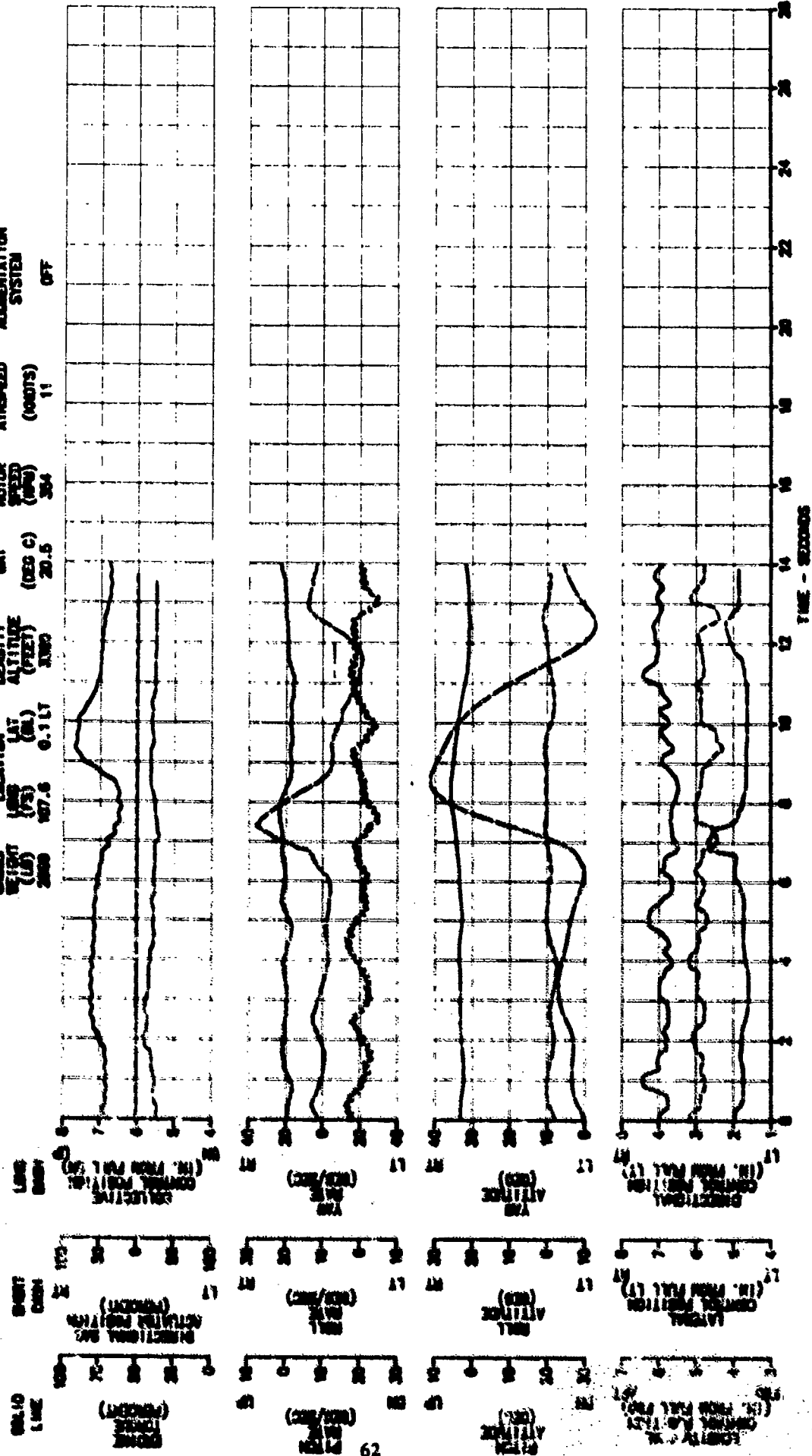


FIGURE E-27

FIGURE 2-27
LEFT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH

501-2MC USA S/N 70-15340

AVG SPEED (KTS)	AVG EIGHT (LB)	AVG CS LOCATION LONG (°S)	AVG CS LAT (°N)	AVG DENSITY ALTITUDE (FEET)	AVG OAT	AVG TRIM	AVG ENGINE SPEED (RPM)	TAKE OFF SPEED (KNOTS)	STABILITY Augmentation System
2000	1200	108.7	0.111	3400	20.5	355	20	ON	

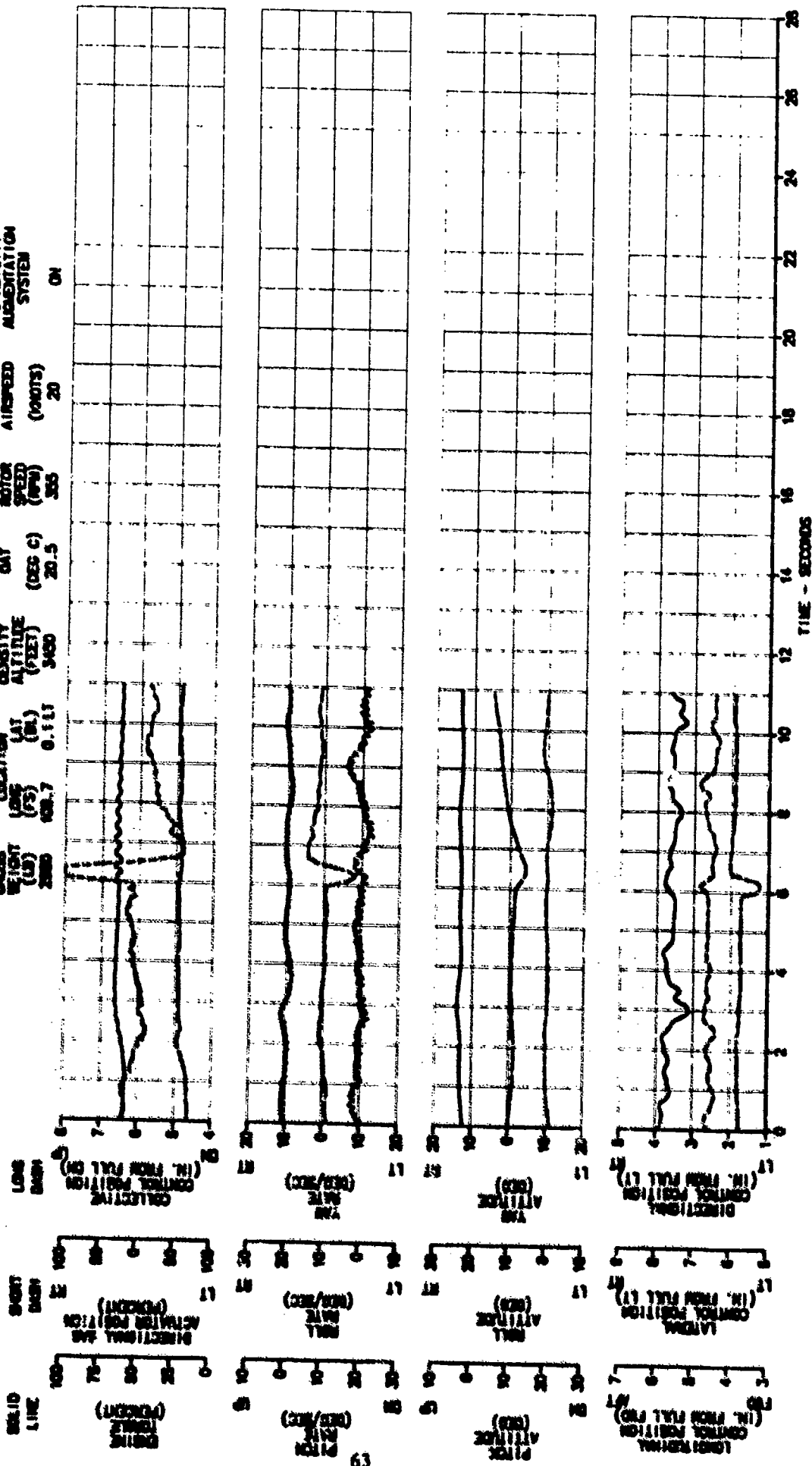


FIGURE E-28
LEFT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH

JOH-58C USA S/N 70-15349
 AVG CROSS WEIGHT (LB) 2970
 AVG CG LOCATION
 LONG (FS) 108.7
 LAT (BL) 0.1 LT
 DENSITY ALTITUDE (FEET) 3300
 AVG QAT (DEG C) 19.5
 TRIM ROTOR SPEED (RPM) 354
 TRUE AIRSPEED (KNOTS) 20
 STABILITY AUGMENTATION SYSTEM OFF

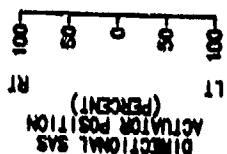
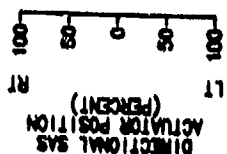
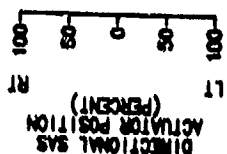
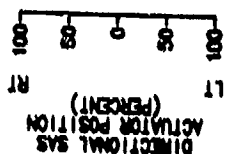
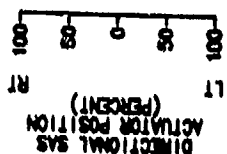
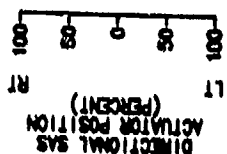
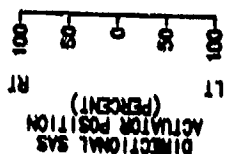
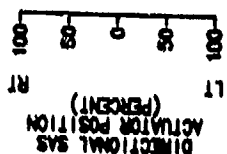
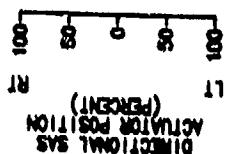
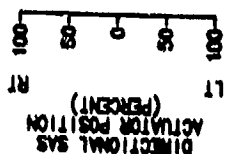
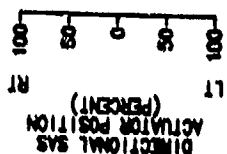
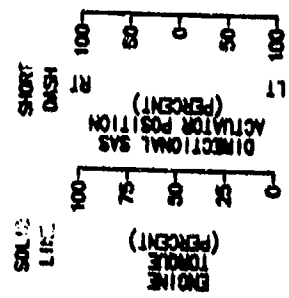


FIGURE E-29
RIGHT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH

J01-59C USA S/N 70-15349

AVG CROSS WEIGHT (LB)	AVG CS LONG (FS)	AVG CS LAT (ML)	AVG DENSITY (DEG C)	AVG OAT (DEG C)	TRIM ROTOR SPEED (RPM)	TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
2880	108.7	-0.1 LT	3420	20.0	354	20	ON

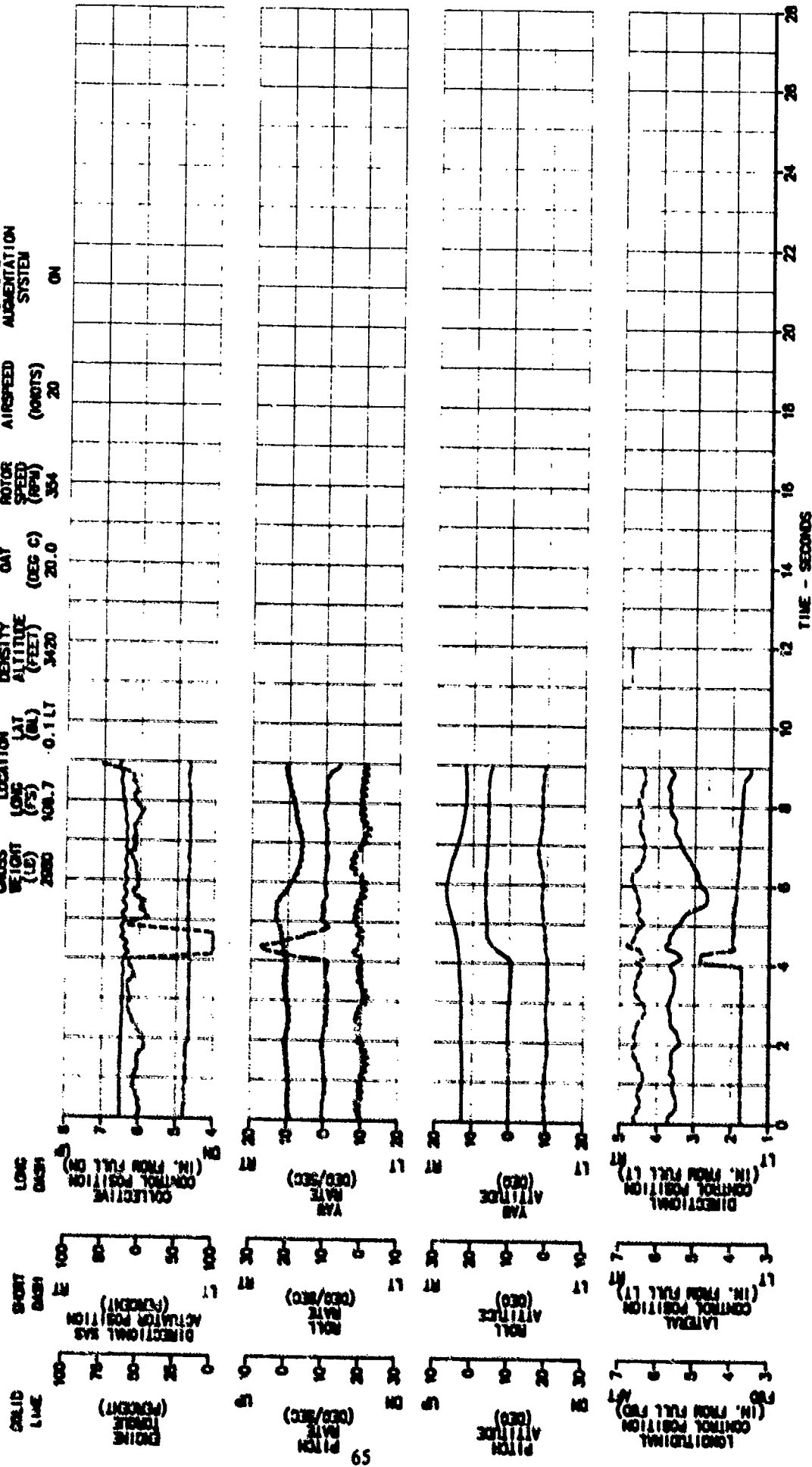


FIGURE E-30
RIGHT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH
J04-50C USA S/N 70-15349

AVG CROSS WEIGHT (LB) 2870
AVG CS LONG (FS) 108.7
AVG CS LOCATION LAT (BL) 0.1 LT
AVG DENSITY ALTITUDE (FEET) 3370
AVG OAT (DEG C) 18.5
TRIM MOTOR SPEED (RPM) 353
TIME AIRSPEED (KNOTS) 20
STABILITY AUGMENTATION SYSTEM OFF

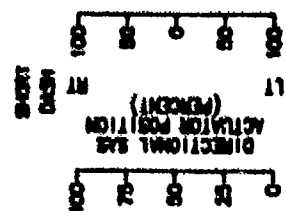
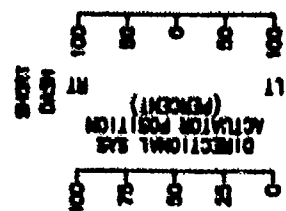
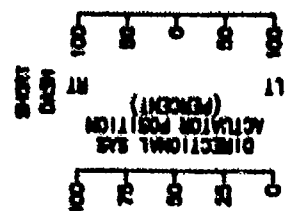
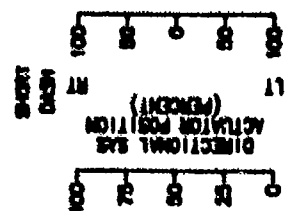
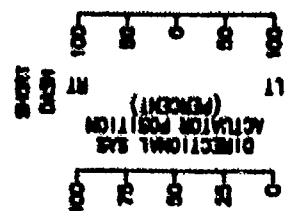
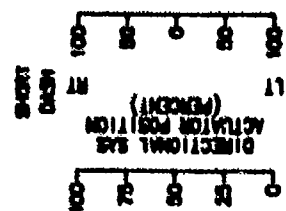
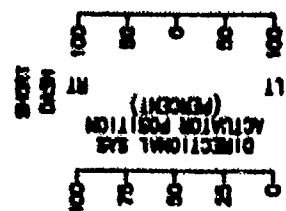
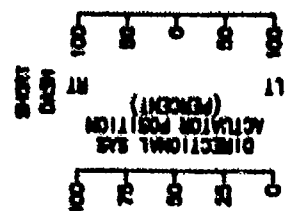
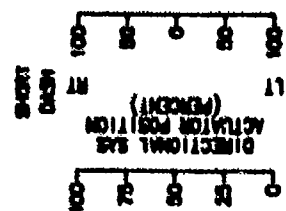
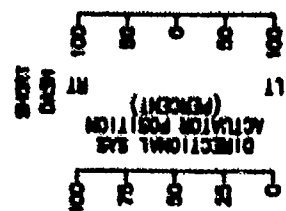
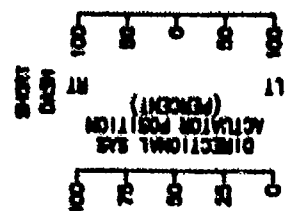
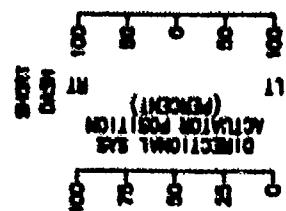
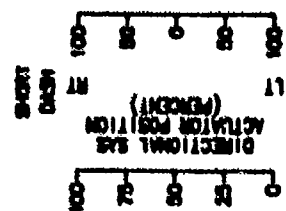
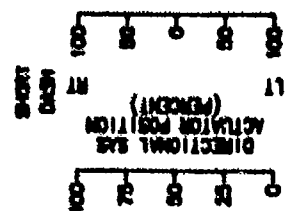
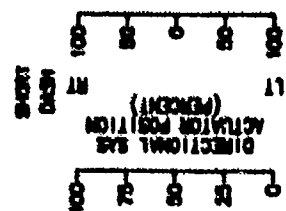
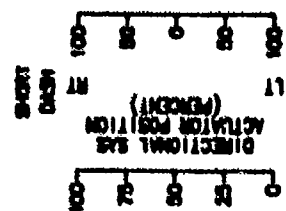
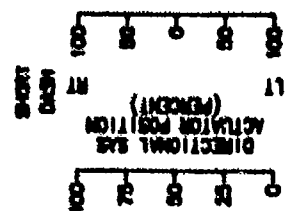
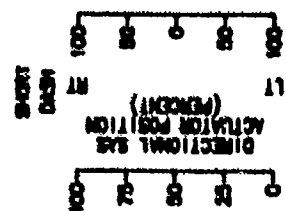
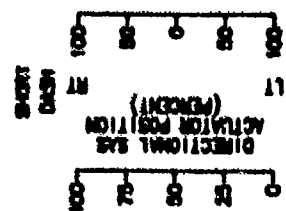
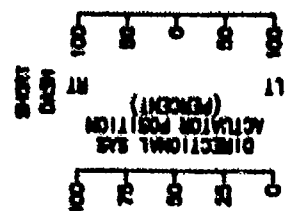
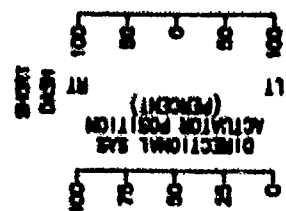
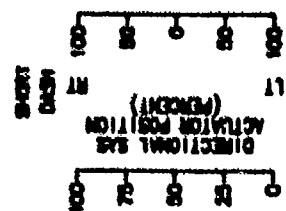
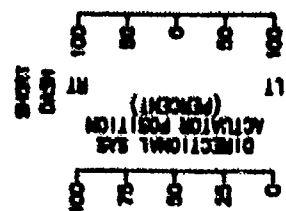
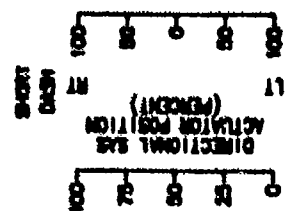
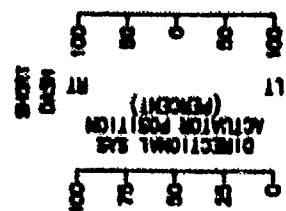
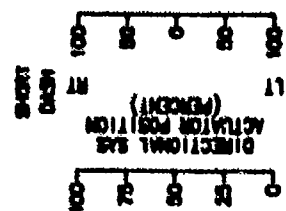
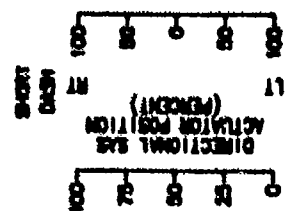
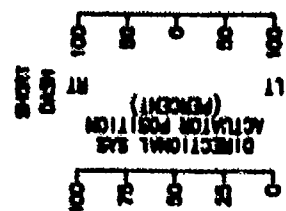
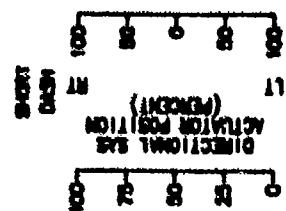
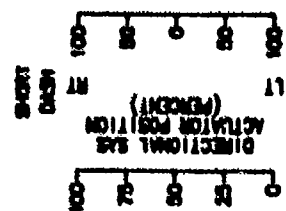
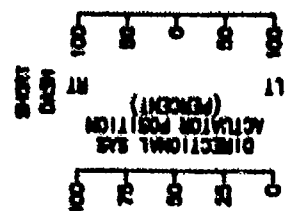
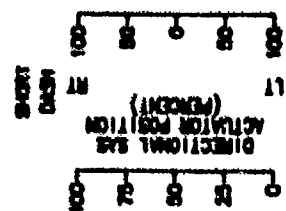
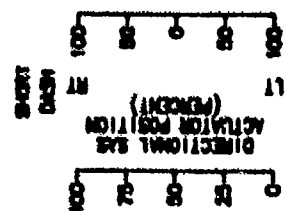
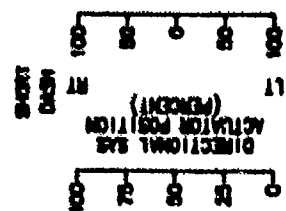
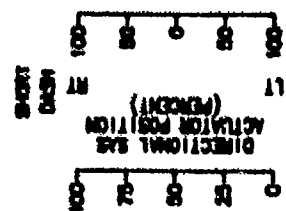
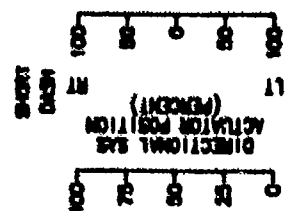
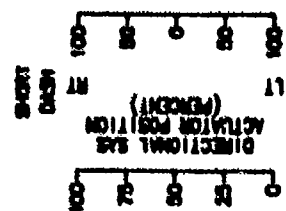
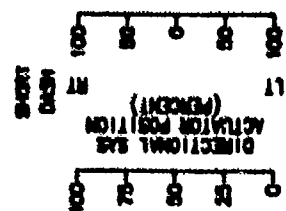
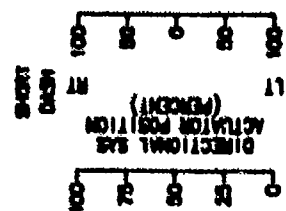
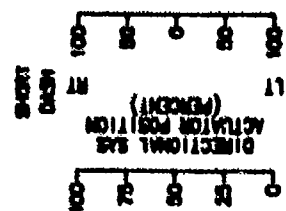
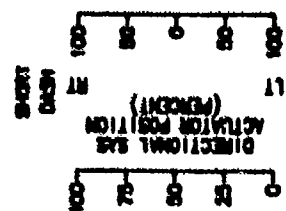
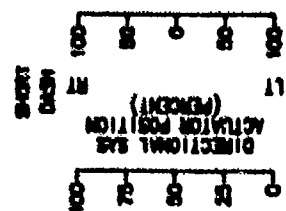
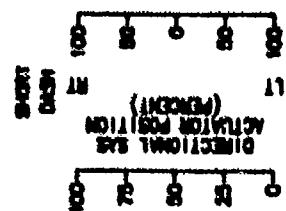
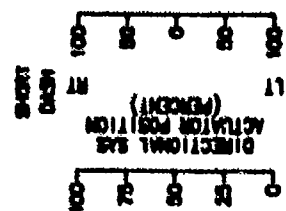
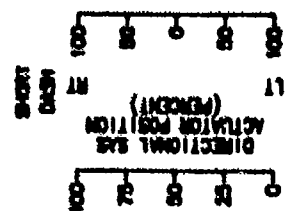
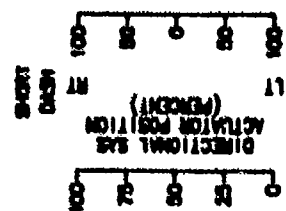
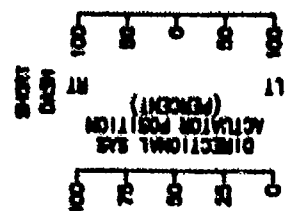
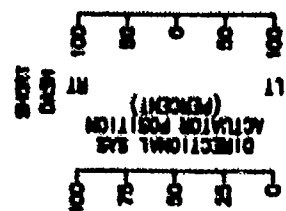
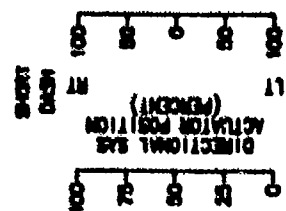
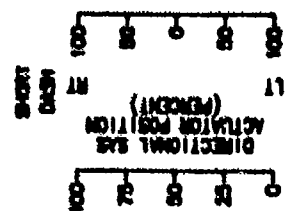
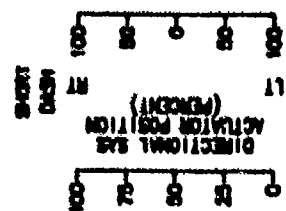
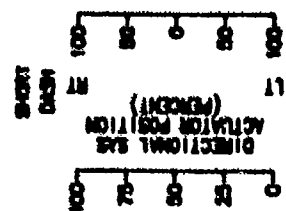
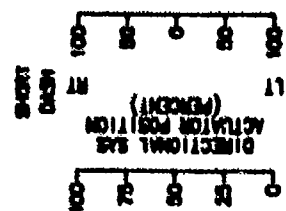
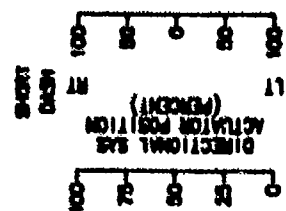
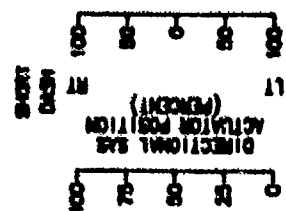
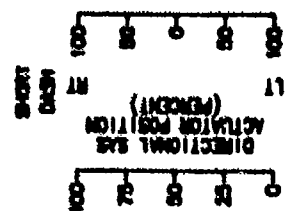
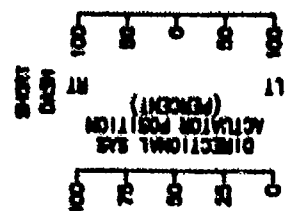
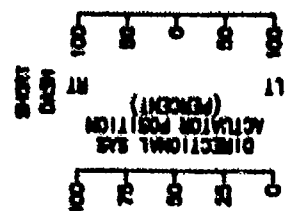
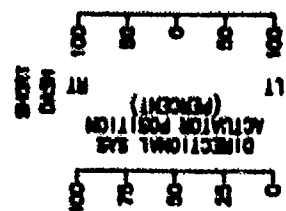
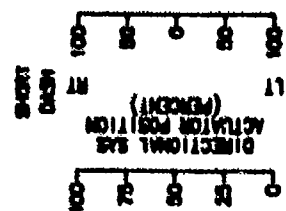
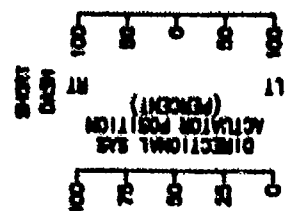
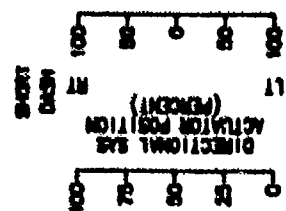
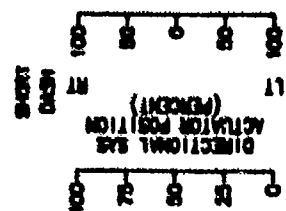
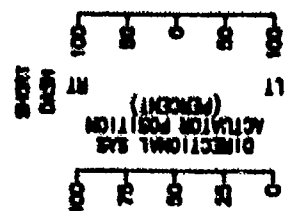
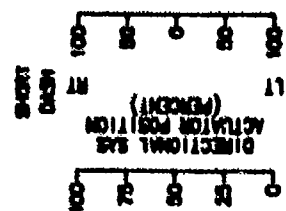
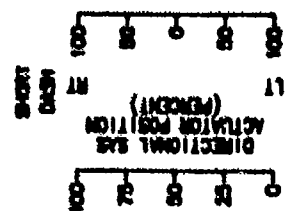
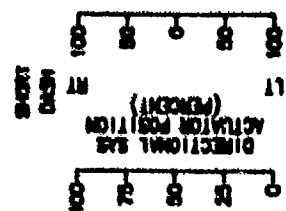
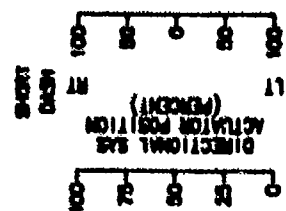
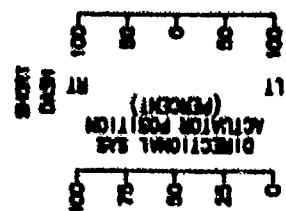
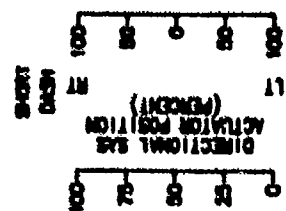
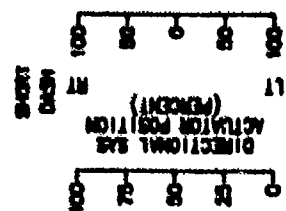
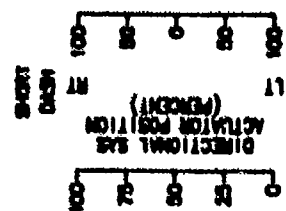
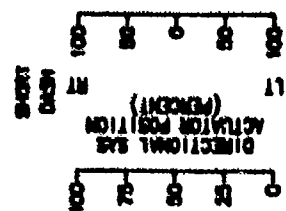
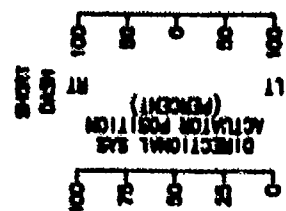
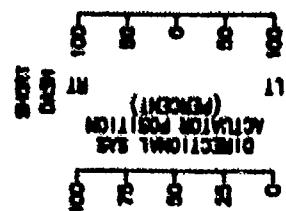
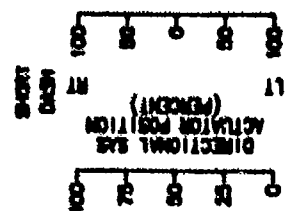
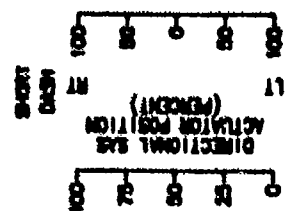
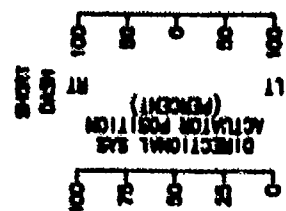
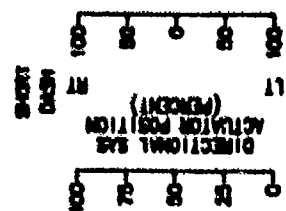
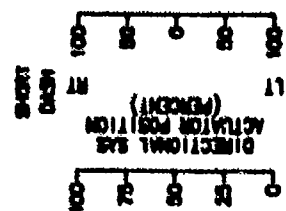
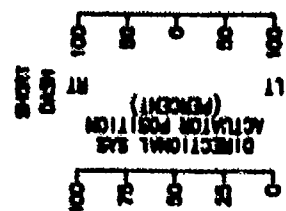
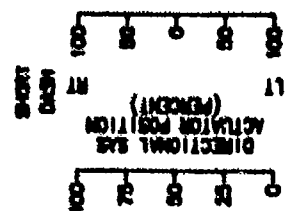
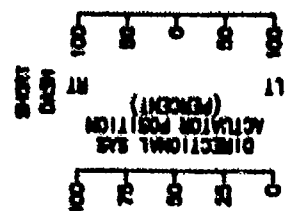
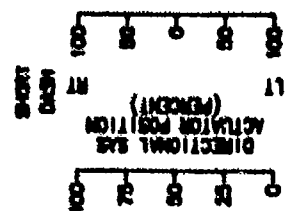
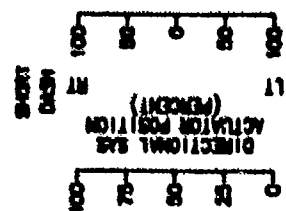
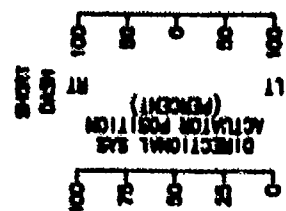
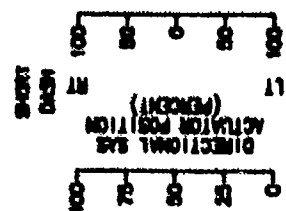
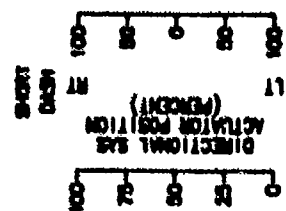
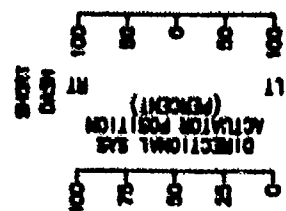
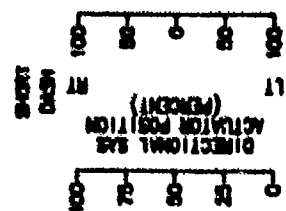
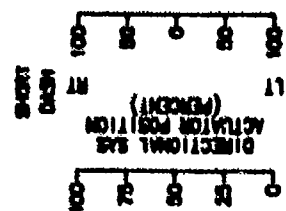
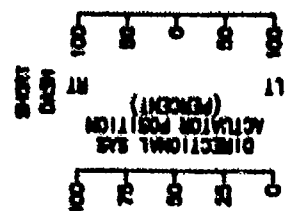
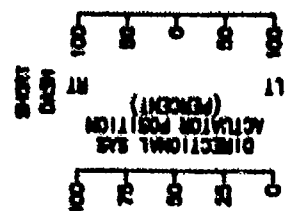
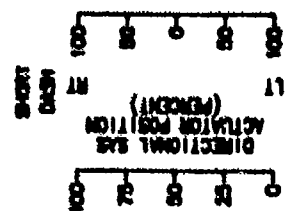
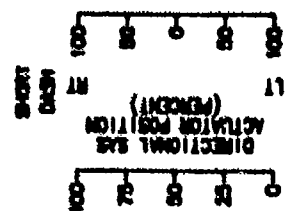
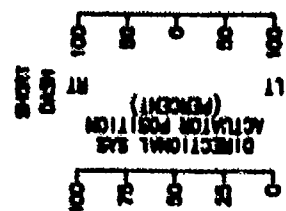
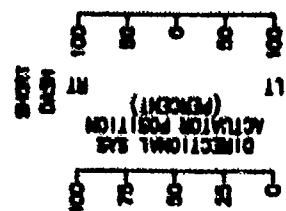
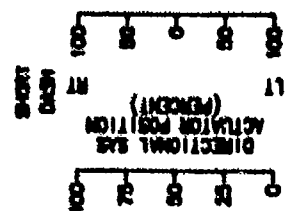
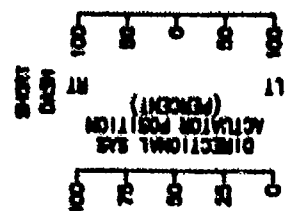
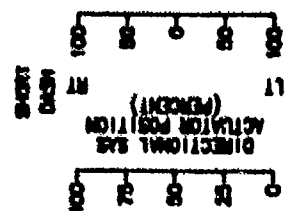
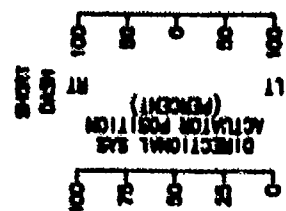
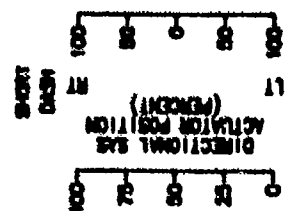
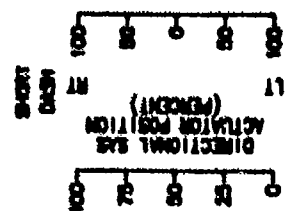
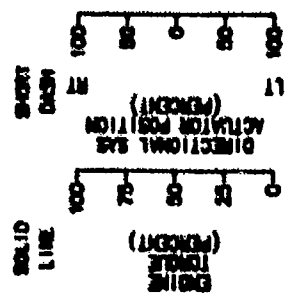


FIGURE E-31
LEFT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH

J04-50C USA S/N 70-15349

AVG CRDS WEIGHT (LB)	2870	AVG CO LONG (F/S)	108.7	AVG CO LAT (BL)	0.1 LT	AVG DENSITY ALTITUDE (FEET)	3420	AVG OAT (DEG C)	20.0	TRIM ROTOR SPEED (RPM)	304	TRUE AIRSPEED (KNOTS)	30	STABILITY AUGMENTATION SYSTEM	ON
----------------------	------	-------------------	-------	-----------------	--------	-----------------------------	------	-----------------	------	------------------------	-----	-----------------------	----	-------------------------------	----

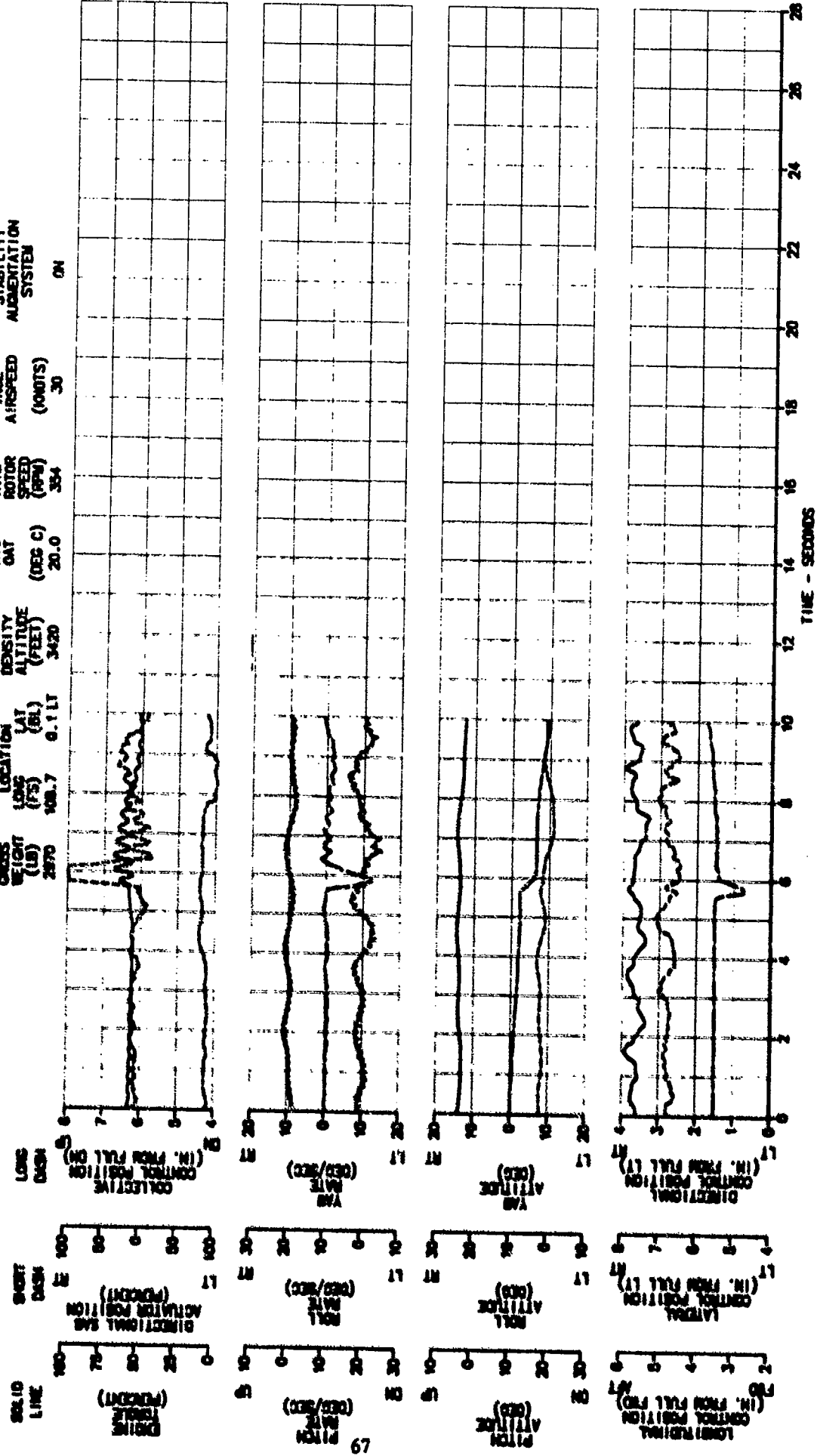
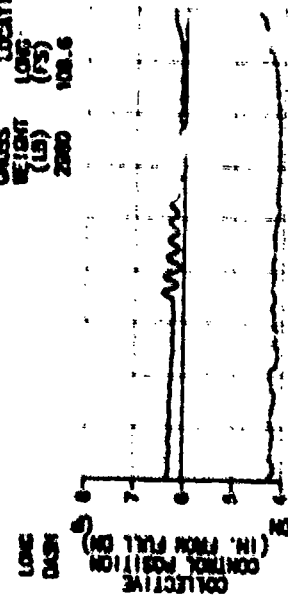
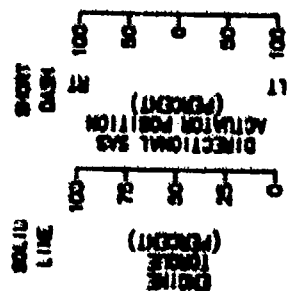


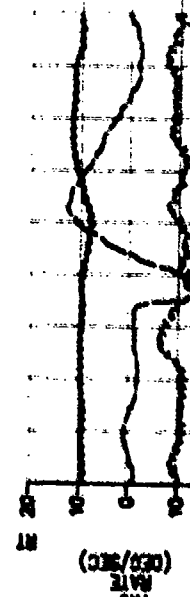
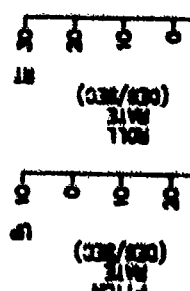
FIGURE E-32
LEFT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH

JOM-50C USA S/N 70-15349

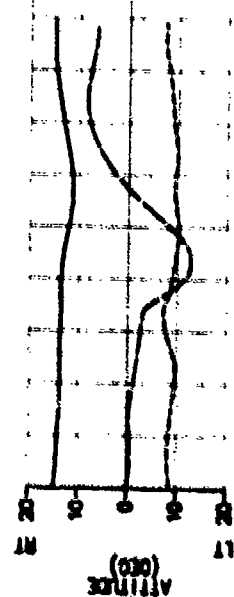
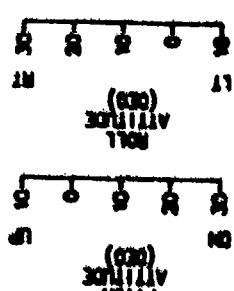
AVG CRUS WEIGHT (LB)	2000	AVG CO LONG (FS)	108.6	AVG LAT (BL)	0.117	AVG DENSITY (DEG C)	19.5	TRIM ROTOR SPEED (RPM)	305	TRUE AIRSPEED (KNOTS)	30	STABILITY AUGMENTATION SYSTEM	OFF
----------------------	------	------------------	-------	--------------	-------	---------------------	------	------------------------	-----	-----------------------	----	-------------------------------	-----



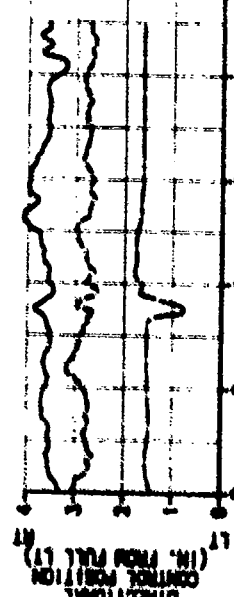
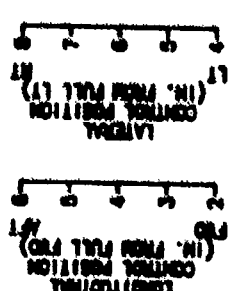
LONG DASH (IN. FROM FULL ON)



LONG DASH (IN. FROM FULL ON)



LONG DASH (IN. FROM FULL ON)



LONG DASH (IN. FROM FULL ON)

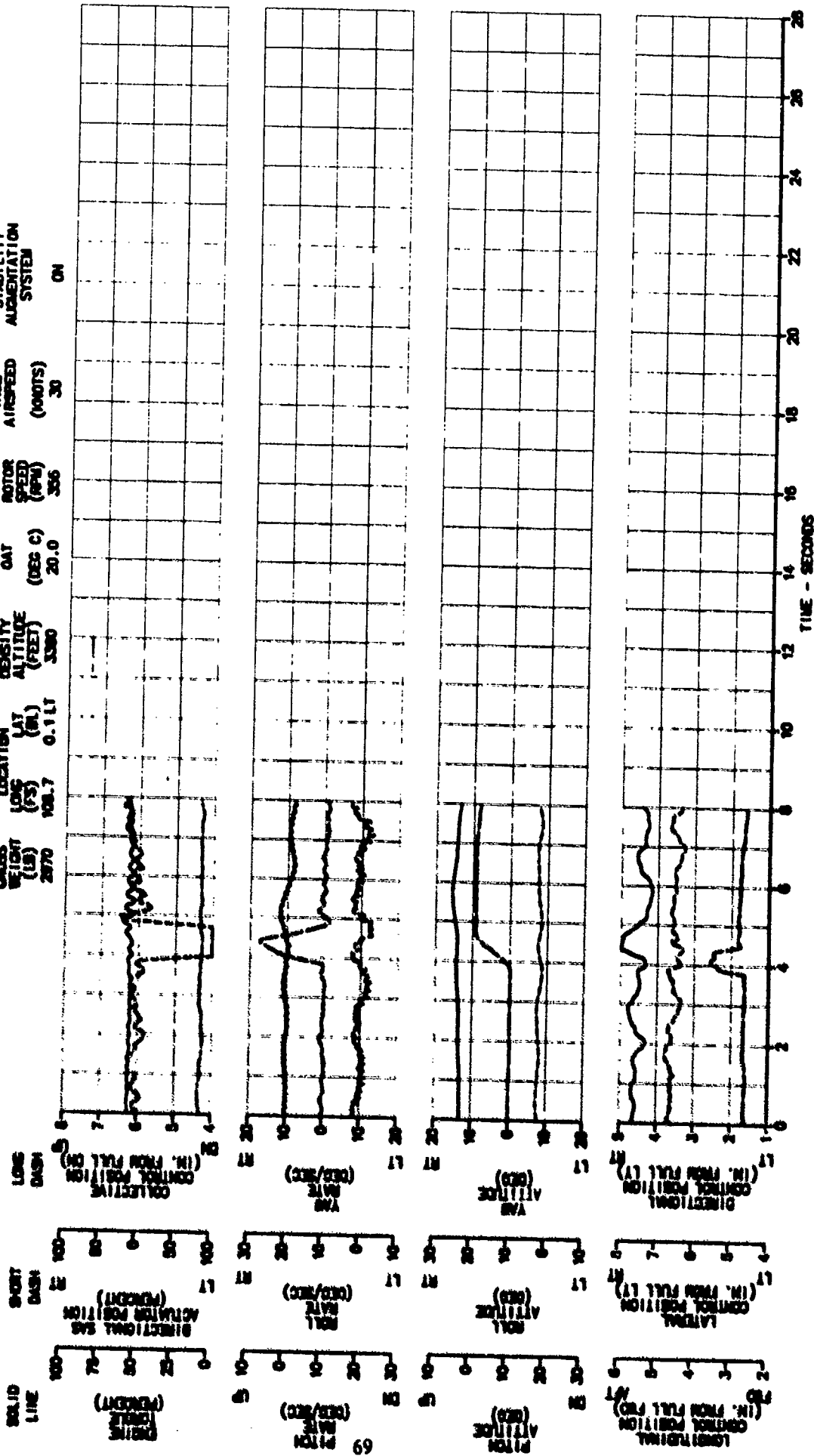
TIME - SECONDS

FIGURE E-33

RIGHT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH

JOM-88C USA S/N 70-15348

AVG CROSS WEIGHT (LB) 2870
 AVG CS LOCATION (FS) 108.7
 LAT (IN.) 0.1 LT
 DENSITY ALTITUDE (FEET) 3380
 AVG GAT (DEG C) 20.0
 TRIM MOTOR SPEED (RPM) 356
 TRUE AIRSPEED (KNOTS) 30
 STABILITY AUGMENTATION SYSTEM ON



TIME - SECONDS

FIGURE E-34
RIGHT DIRECTIONAL PULSE INPUT - 090 DEGREE AZIMUTH

JOM-88C UBA S/N 70-15349
 TRIM ROTOR SPEED (RPM) 356
 AIRSPEED (KNOTS) 30
 STABILITY AUGMENTATION SYSTEM OFF
 AVG CROSS WEIGHT (LB) 2050
 AVG CS LOCATION LONG (°S) 108.6 LAT (°N) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 1350
 AVG QAT (DEG C) 19.5

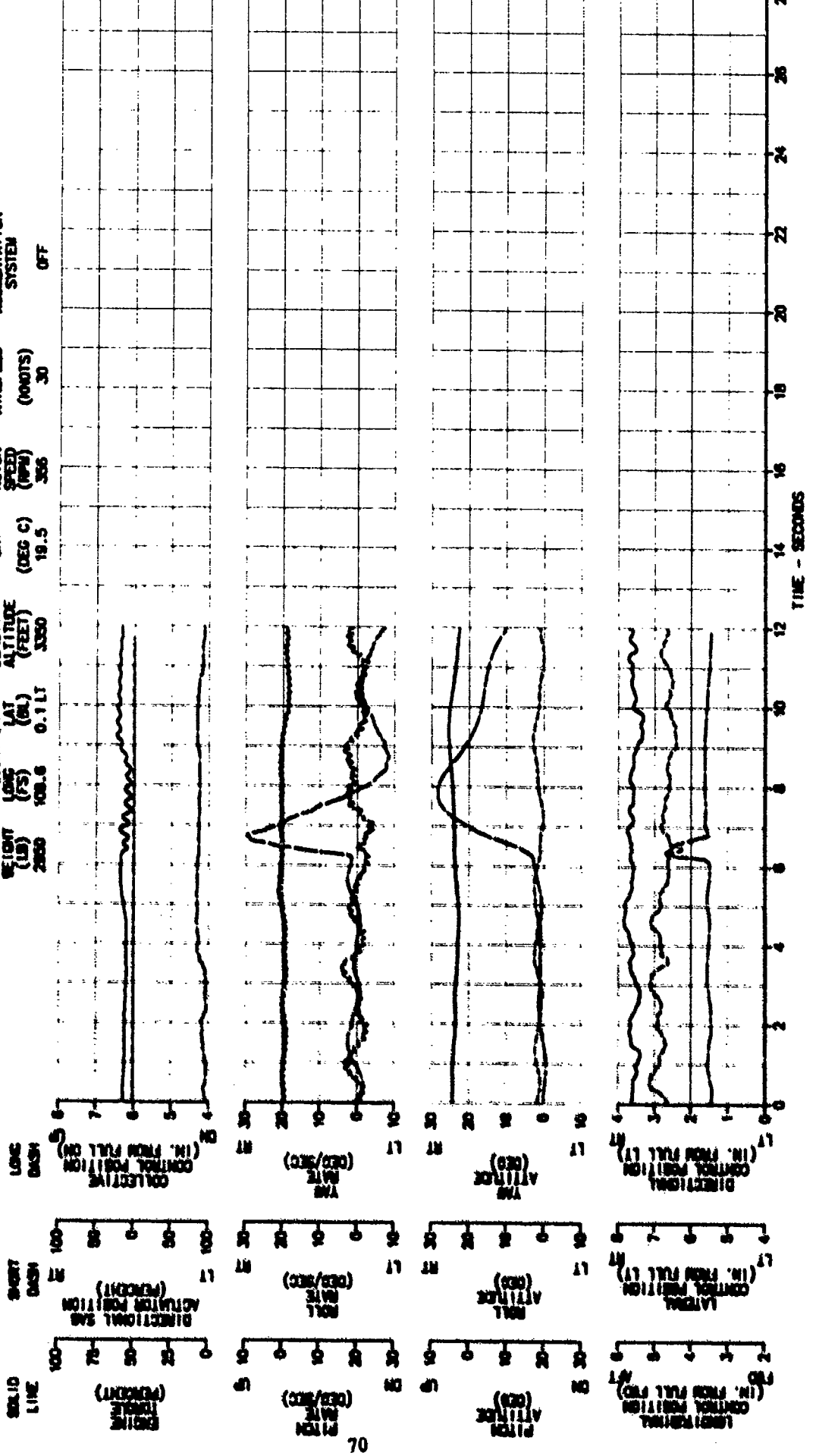
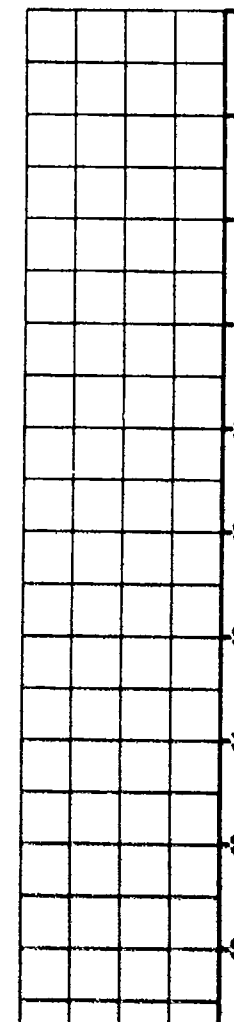
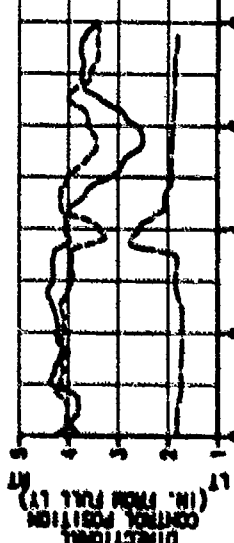
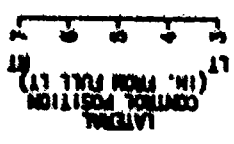
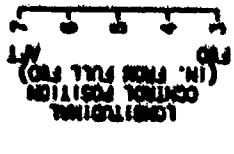
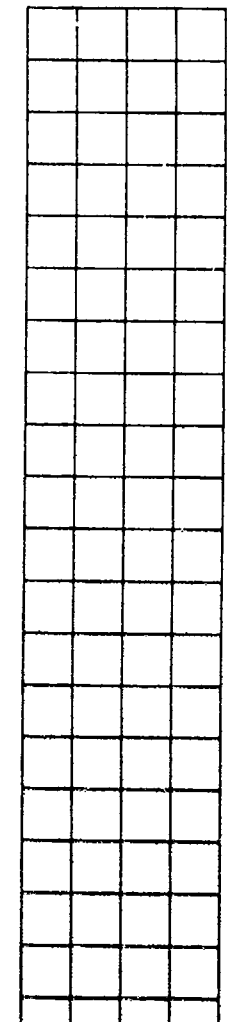
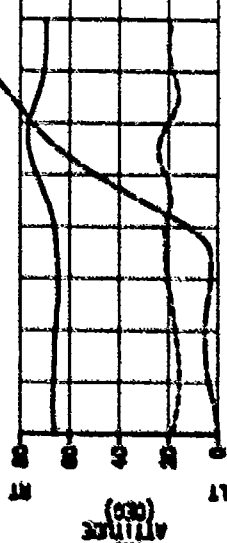
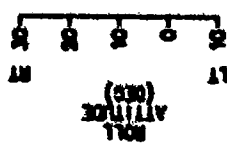
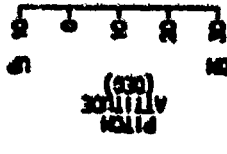
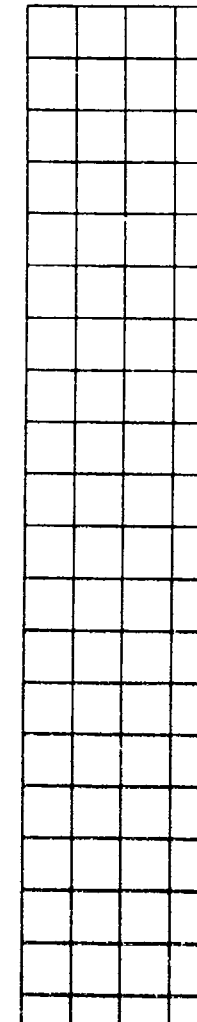
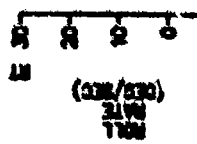
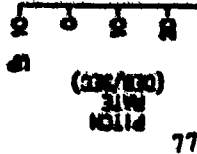
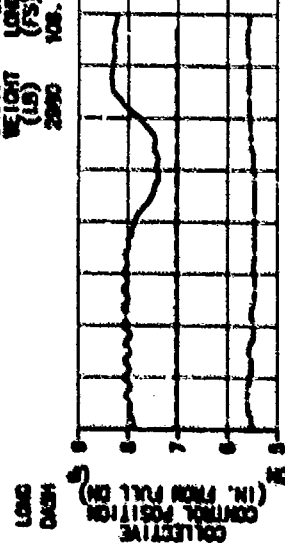
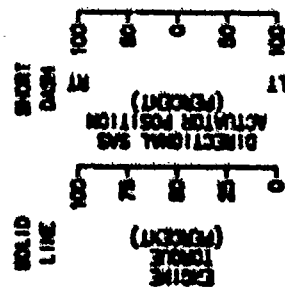


FIGURE E-41
RIGHT DIRECTIONAL PULSE INPUT - 120 DEGREE AZIMUTH

JOH-88C LBA S/N 70-15349
AVG CROSS WEIGHT (LB) 2090
AVG CO LONG (FS) 108.1
AVG CO LAT (BL) 0.117
AVG DENSITY ALTITUDE (FEET) 3520
AVG GAT (DEG C) 21.0
TRIM MOTOR SPEED (RPM) 352
TRUE AIRSPEED (KNOTS) 10
STABILITY AUGMENTATION SYSTEM OFF



TIME - SECONDS

28 26 24 22 20 18 16 14 12 10 8 6 4 2 0

FIGURE E-42
LEFT DIRECTIONAL PULSE INPUT - 120 DEGREE AZIMUTH

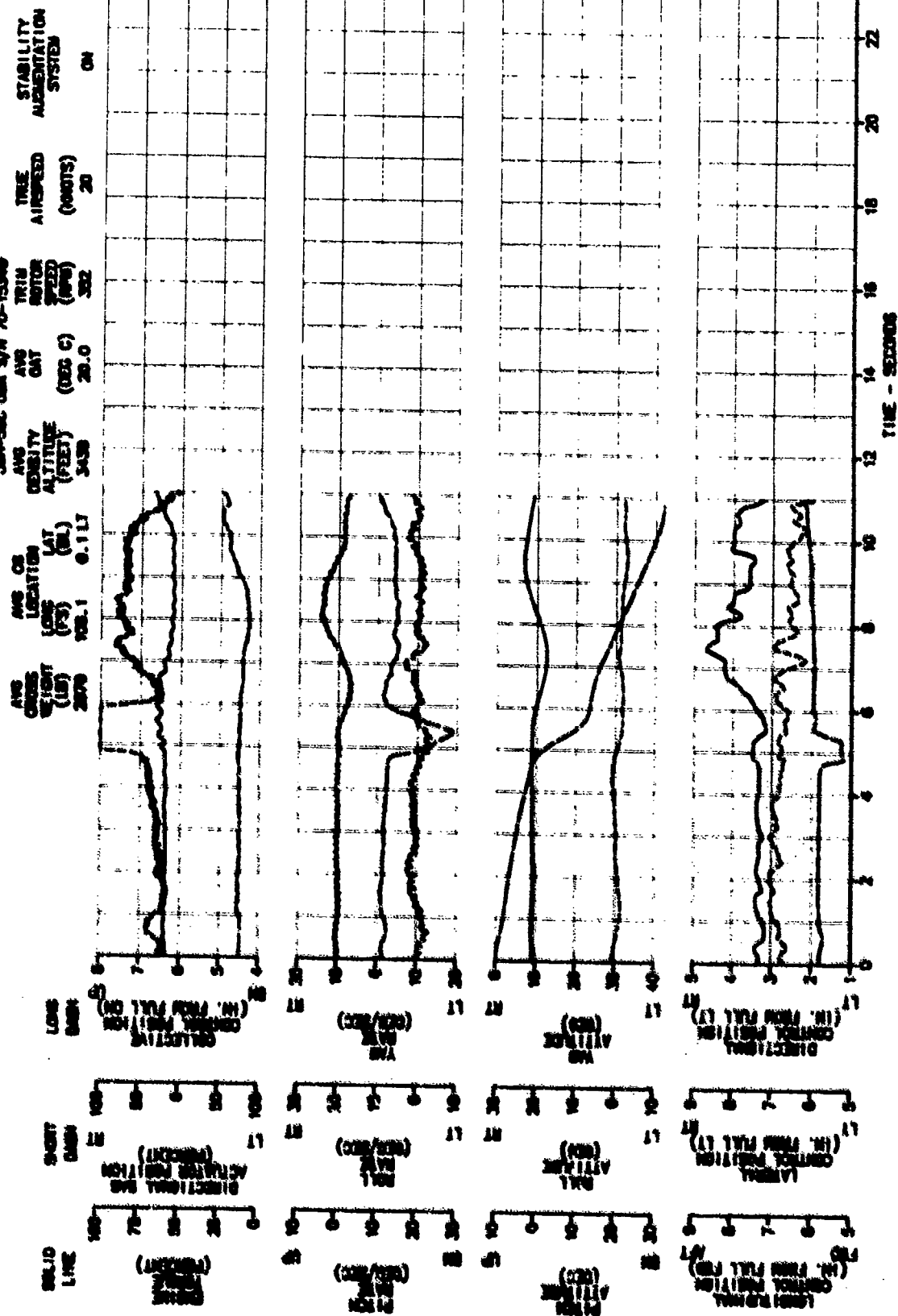


FIGURE E-43
LEFT DIRECTIONAL PULSE INPUT - 120 DEGREE AZIMUTH

JSM-SEC USA S/N 70-15348
 TRUE AIRSPEED (KNOTS) 20
 STABILITY AUGMENTATION SYSTEM OFF
 TRIM ROTOR SPEED (RPM) 355
 AVG DENSITY 20.5
 ALTITUDE (FEET) 3450
 LONG (°E) 108.8
 LAT (°N) 0.117

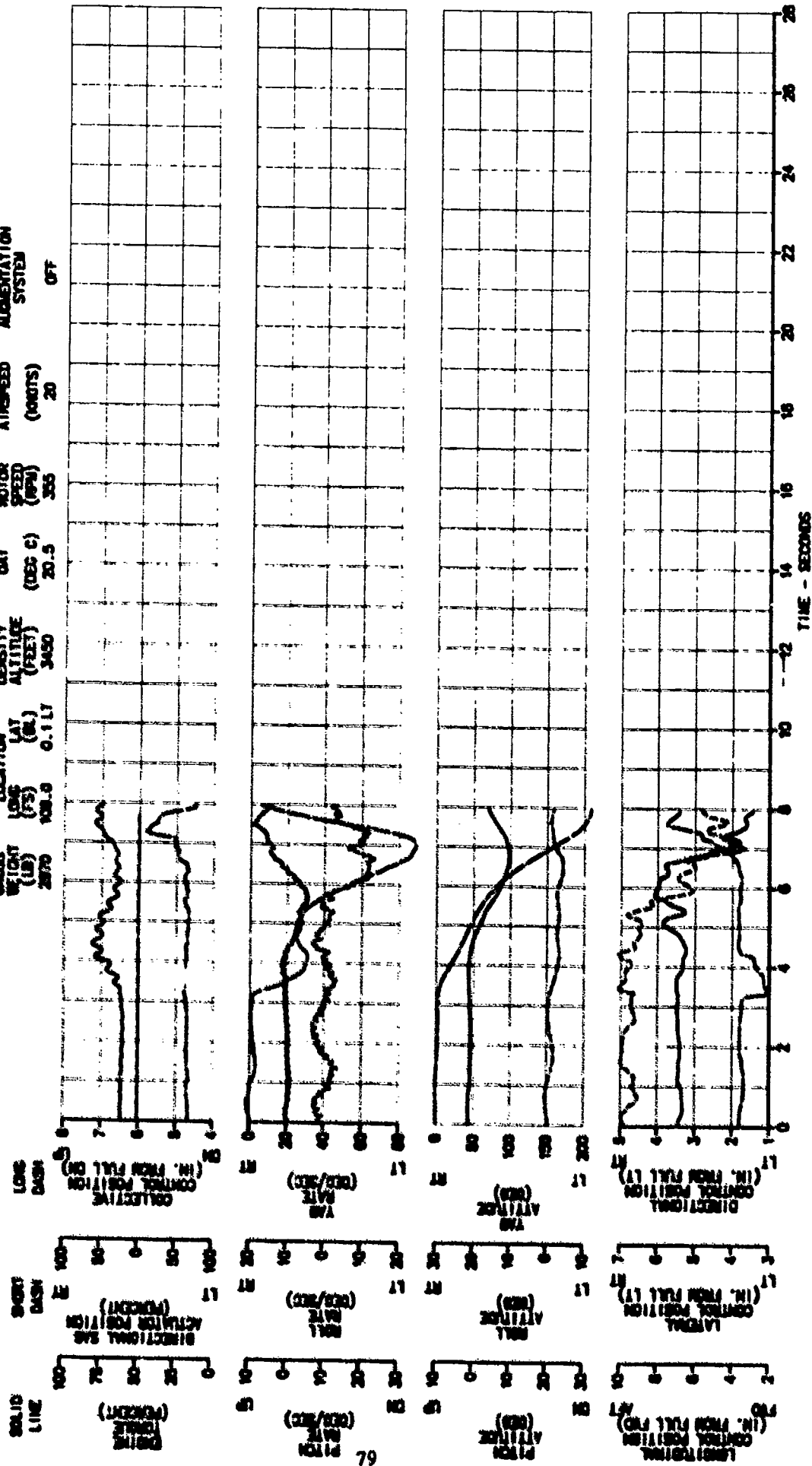


FIGURE E-44
 RIGHT DIRECTIONAL PULSE INPUT - 120 DEGREE AZIMUTH
 JON-00C USA S/N 70-15348

AVG CRMS WEIGHT (LB)	AVG CS LONG (FS)	AVG CS LAT (BL)	AVG DENSITY ALTITUDE (FEET)	AVG DMT (DEG C)	TRIM MOTOR SPEED (RPM)	TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
2870	108.0	0.1 LT	3420	20.0	353	20	ON

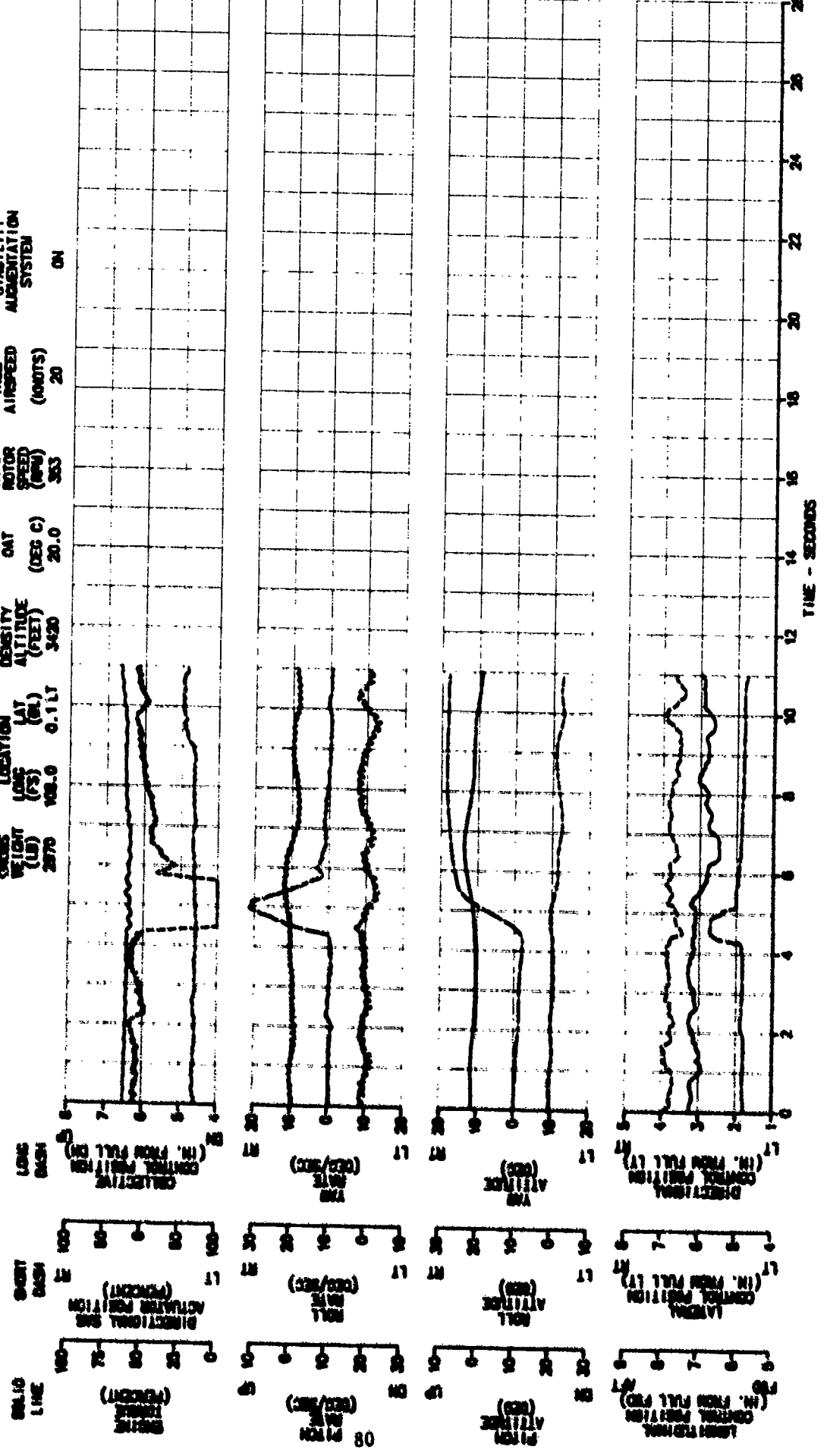


FIGURE C-46
LEFT DIRECTIONAL PULSE INPUT - 120 DEGREE AZIMUTH
JOH-SEC UBA S/N 70-15348

AVG CIRC WEIGHT (LB) 2000
AVG CG LOCATION (IN) 100.0
AVG DENSITY ALTITUDE (FEET) 5430
AVG GAT (DEG C) 20.0
TRIM MOTOR SPEED (RPM) 353
TIME AIRSPEED (KNOTS) 30
STABILITY AUGMENTATION SYSTEM ON

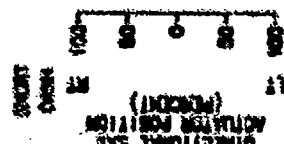
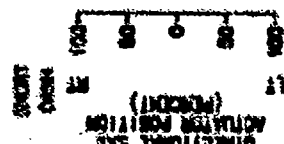
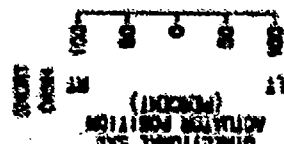
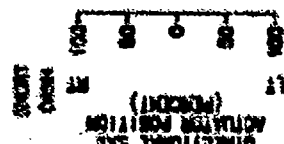
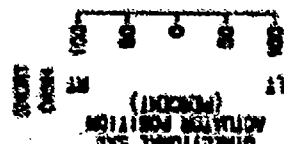
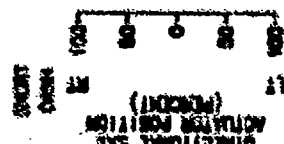
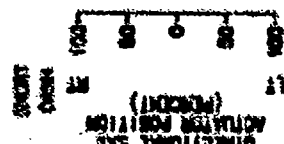
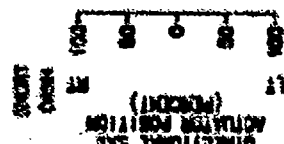
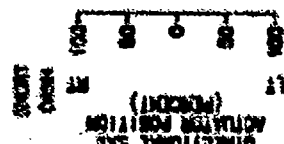
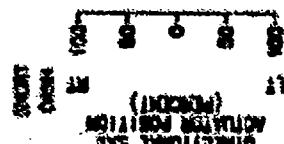
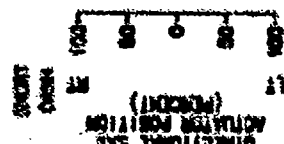
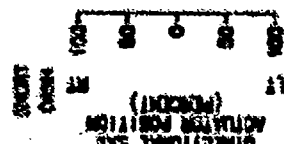
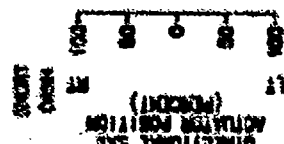
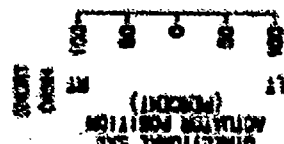
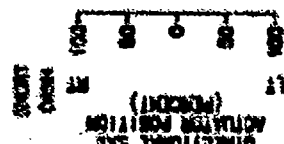
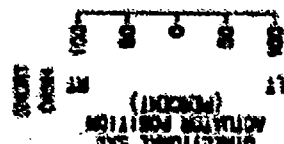
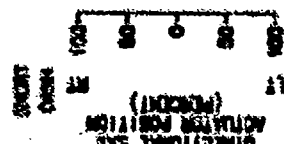
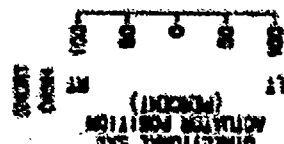
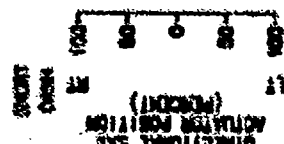
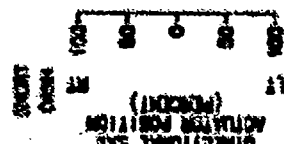
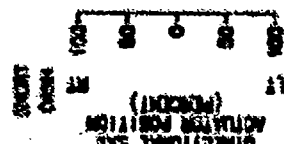
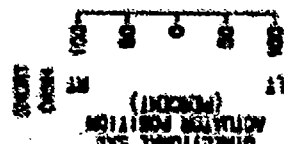
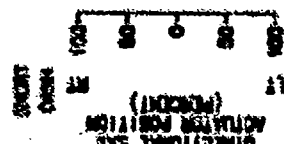
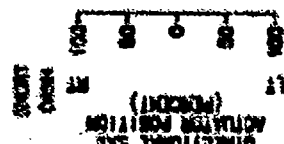
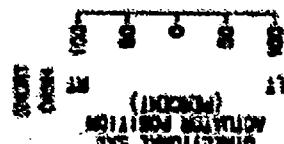
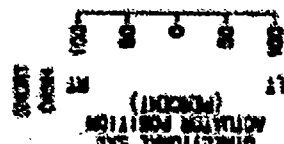
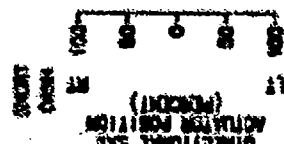
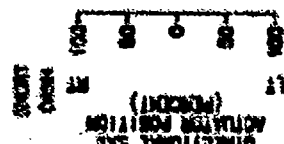
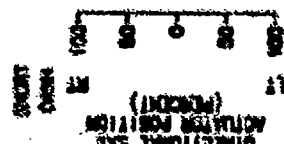
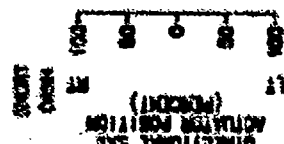
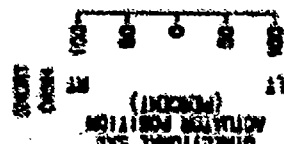
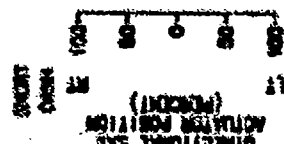
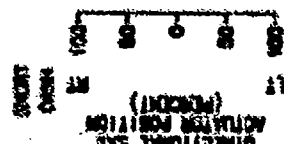
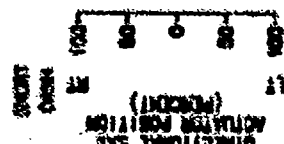
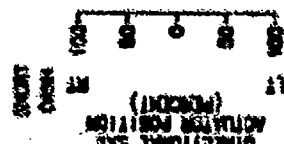
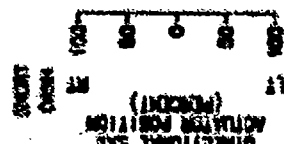
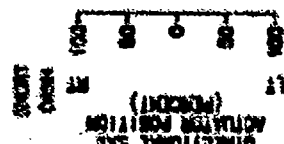
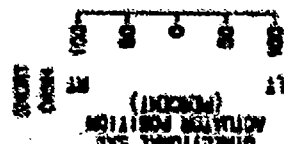
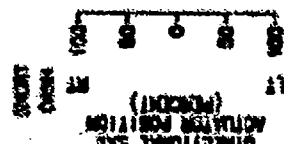
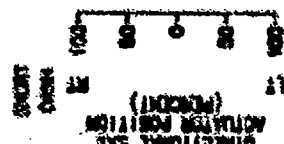
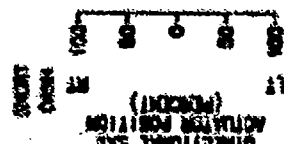
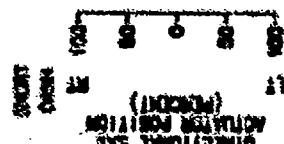
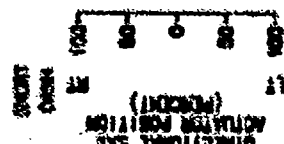
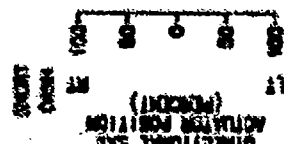
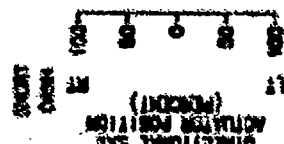
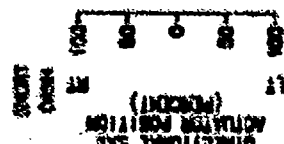
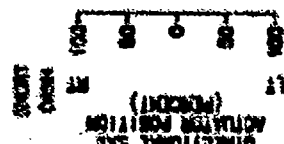
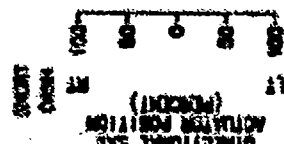
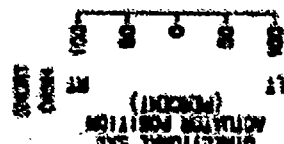
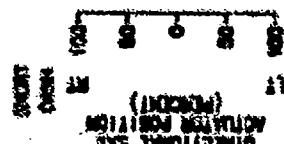
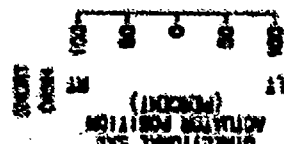
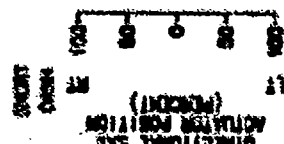
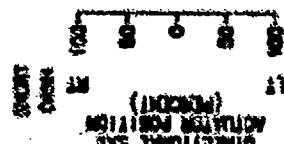
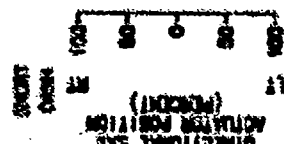
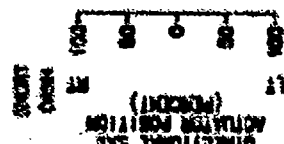
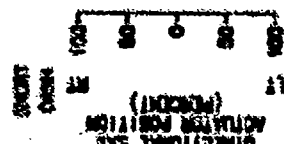
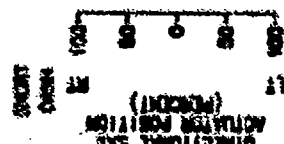
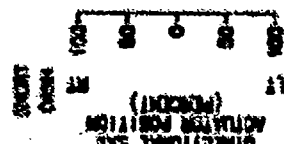
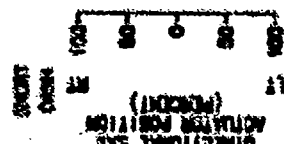
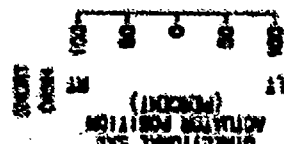
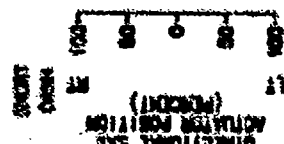
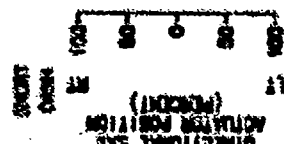
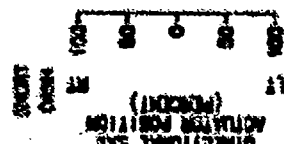
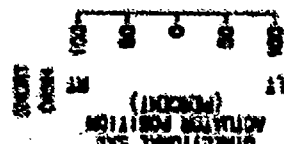
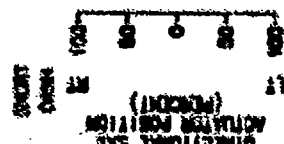
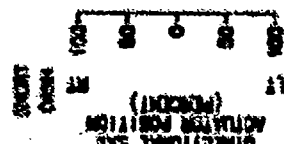
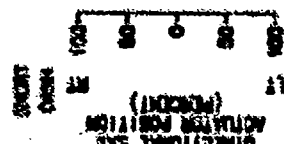
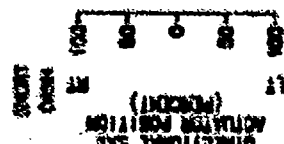
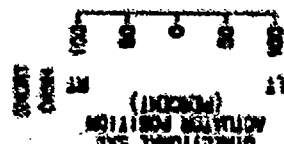
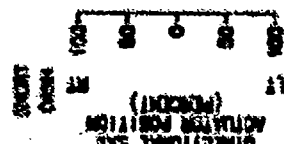
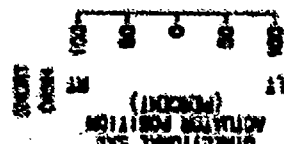
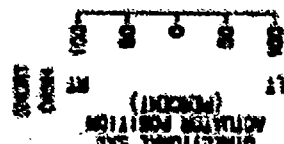
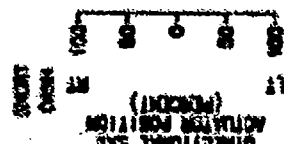
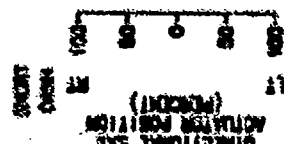
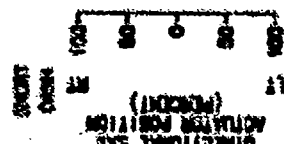
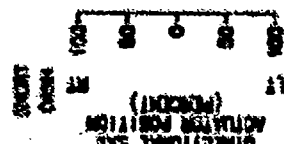
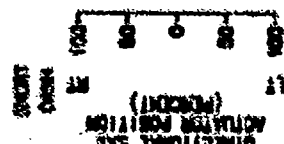
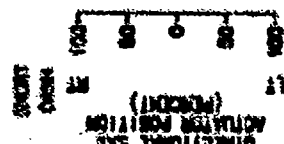
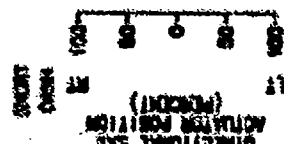
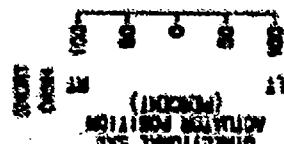
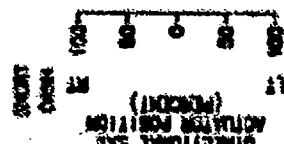
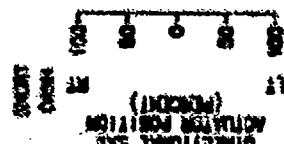
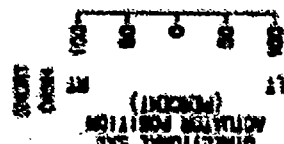
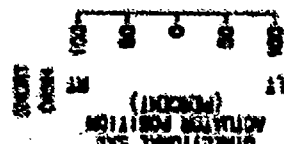
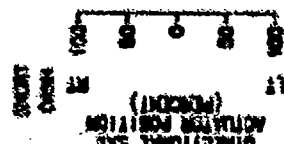
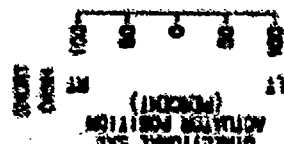
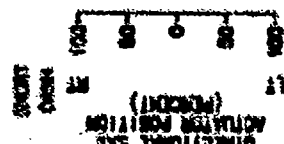
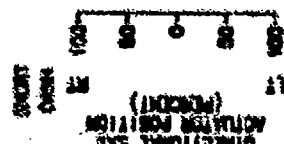
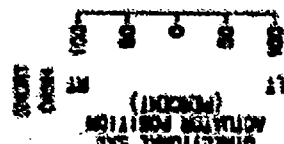
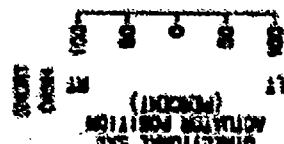
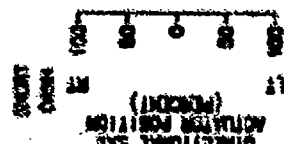
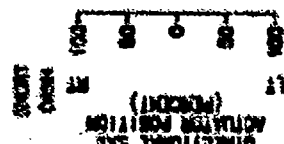
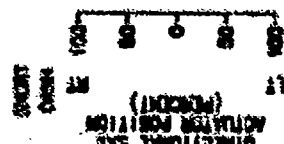
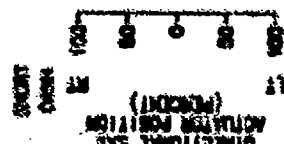
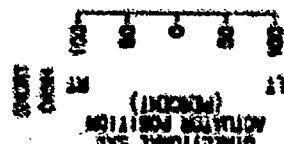
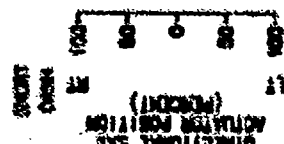
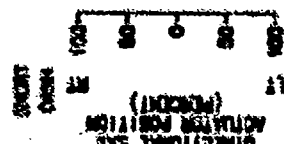
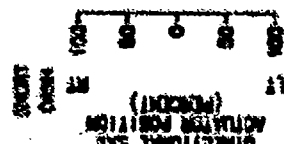
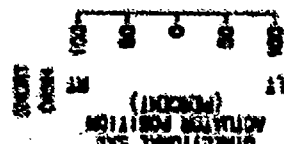
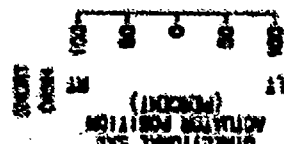
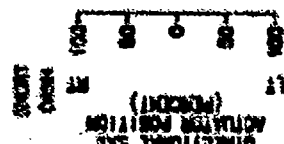
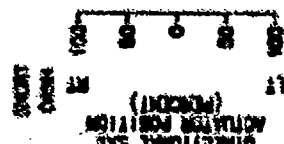
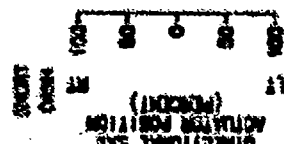
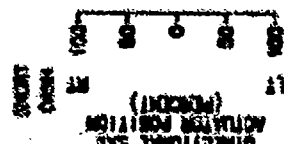
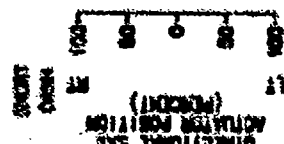
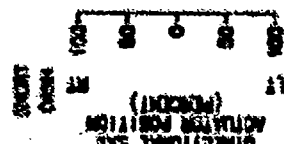
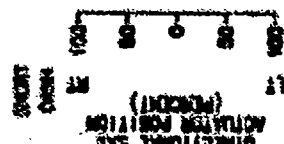
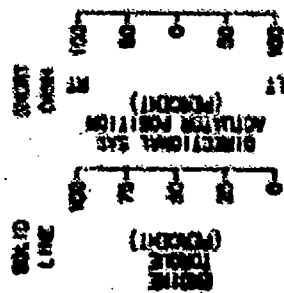


FIGURE E-47
RIGHT DIRECTIONAL PULSE INPUT - 120 DEGREE AZIMUTH

ON-SIG USA S/N 70-15340
 TRIN
 ROTOR SPEED (RPM) 303
 AIRSPEED (KNOTS) 30
 STABILITY AUGMENTATION SYSTEM ON
 AWC
 DENSITY ALTITUDE (FEET) 3430
 (DEG C) 20.0
 AWC CO
 LOCATION
 LONG (PS) 107.6
 LAT (N) -0.11
 AWC
 WEIGHT (LB) 2880

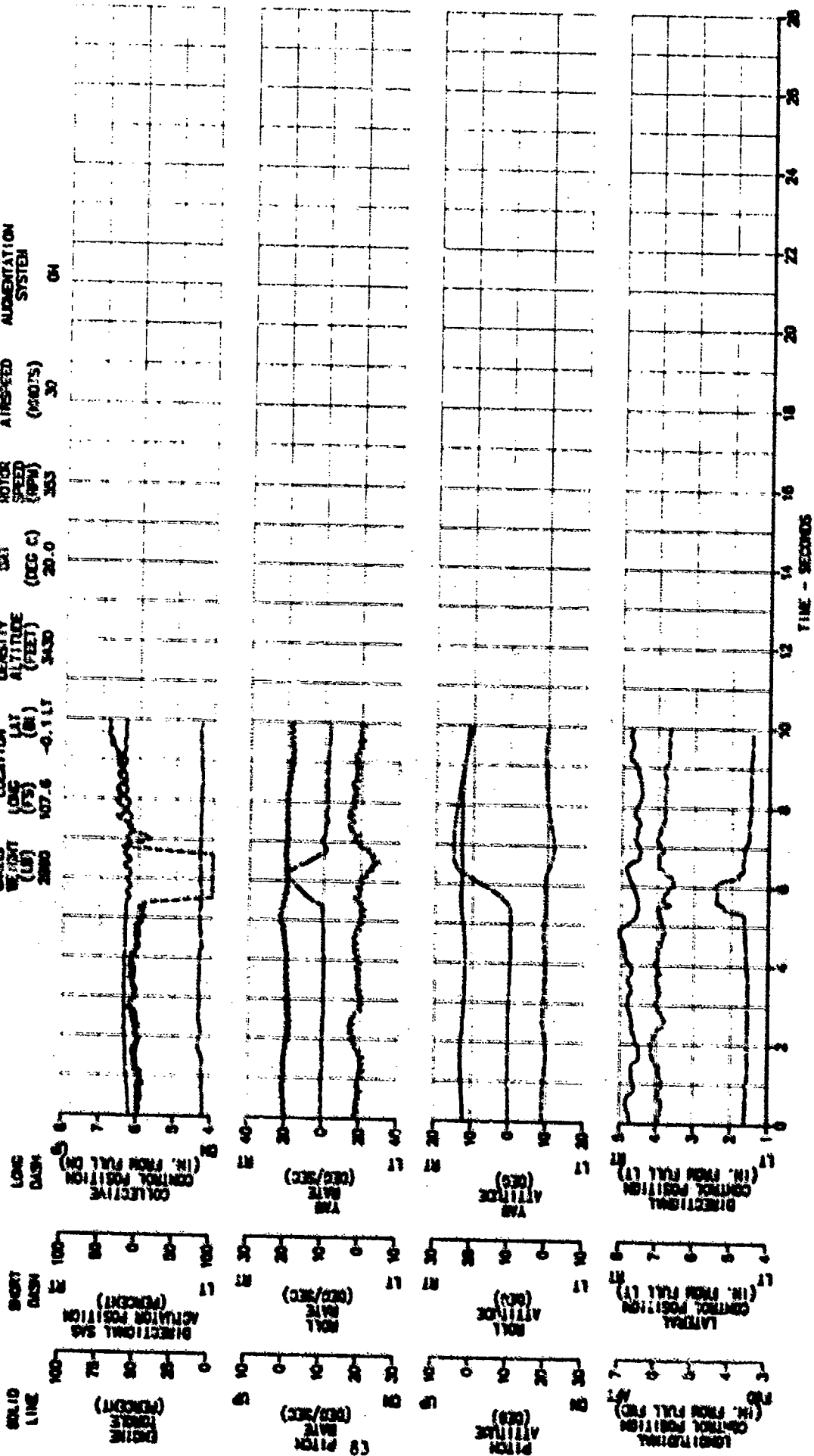
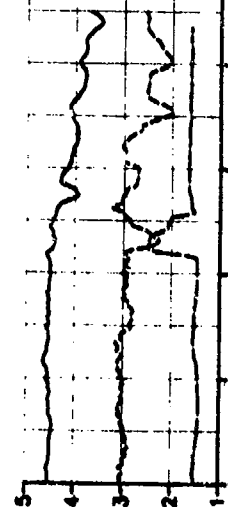
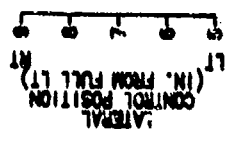
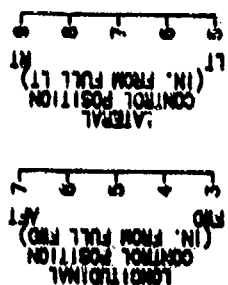
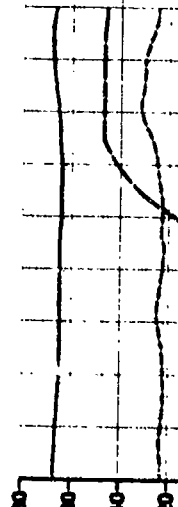
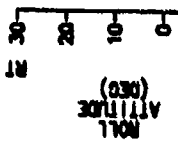
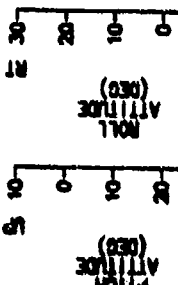
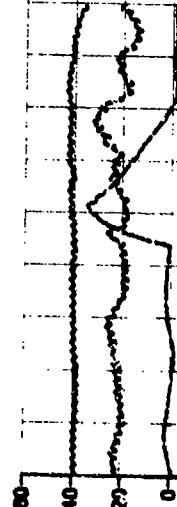
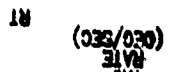
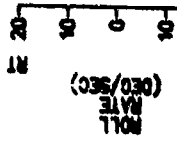
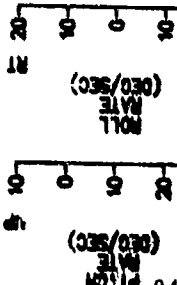
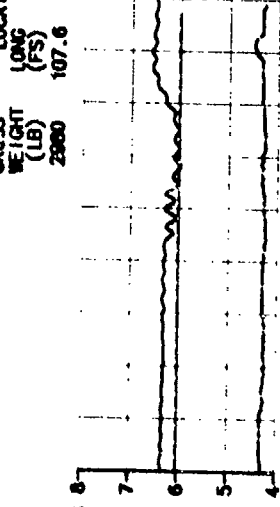
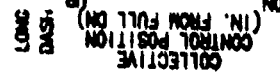
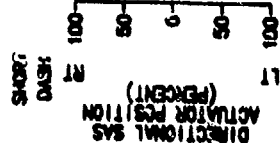
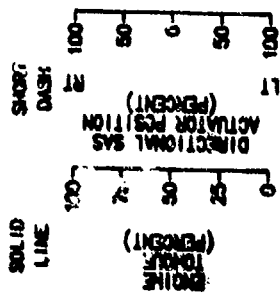


FIGURE E-48
RIGHT DIRECTIONAL PULSE INPUT - 120 DEGREE AZIMUTH
JOH-88C USA S/N 70-15348

TRUE AIRSPEED (KNOTS) 30
STABILITY AUGMENTATION SYSTEM OFF
TRIM ROTOR SPEED (RPM) 363
AVG DENSITY ALT (DEG C) 20.5
AVG ALTITUDE (FEET) 3470
AVG CG LONG (FS) 107.6
AVG CG LAT (BL) 0.1 LT
AVG GROSS WEIGHT (LB) 2980



TIME - SECONDS

FIGURE E-49
LEFT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH
JOH-58C USA S/N 70-15348

STABILITY AUGMENTATION SYSTEM ON
TRUE AIRSPEED (KNOTS) 0
TRIM ROTOR SPEED (RPM) 353
AVG DUTY (DEG C) 20.5
AVG ALTITUDE (FEET) 3460
AVG CG LAT (BL) 0.1 LT
AVG LOCATION (FS) 107.5
GROSS WEIGHT (LB) 2870

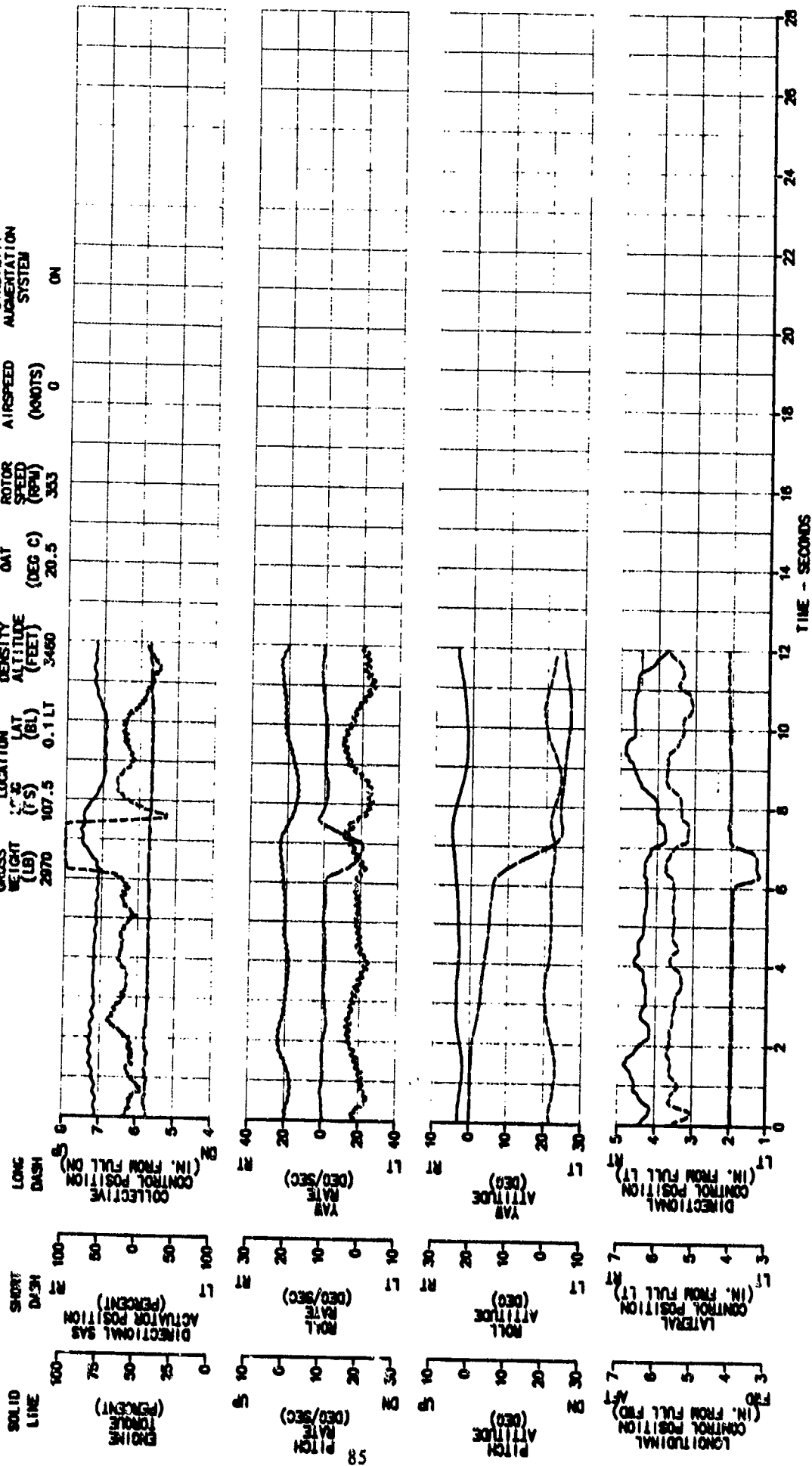


FIGURE E-50
LEFT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JBN-38C USA S/N 70-15349
 TRIM ROTOR SPEED (RPM) 352
 STABILITY AUGMENTATION SYSTEM OFF
 TRUE AIRSPEED (KNOTS) 0
 AVG DENSITY ALT (FEET) 3520
 AVG ALTITUDE (DEG C) 21.0
 AVG CS LAT (IN) 0.1 LT
 AVG CROSS WEIGHT (LB) 2970
 LONG DASH (IN. FROM FULL DN) 5

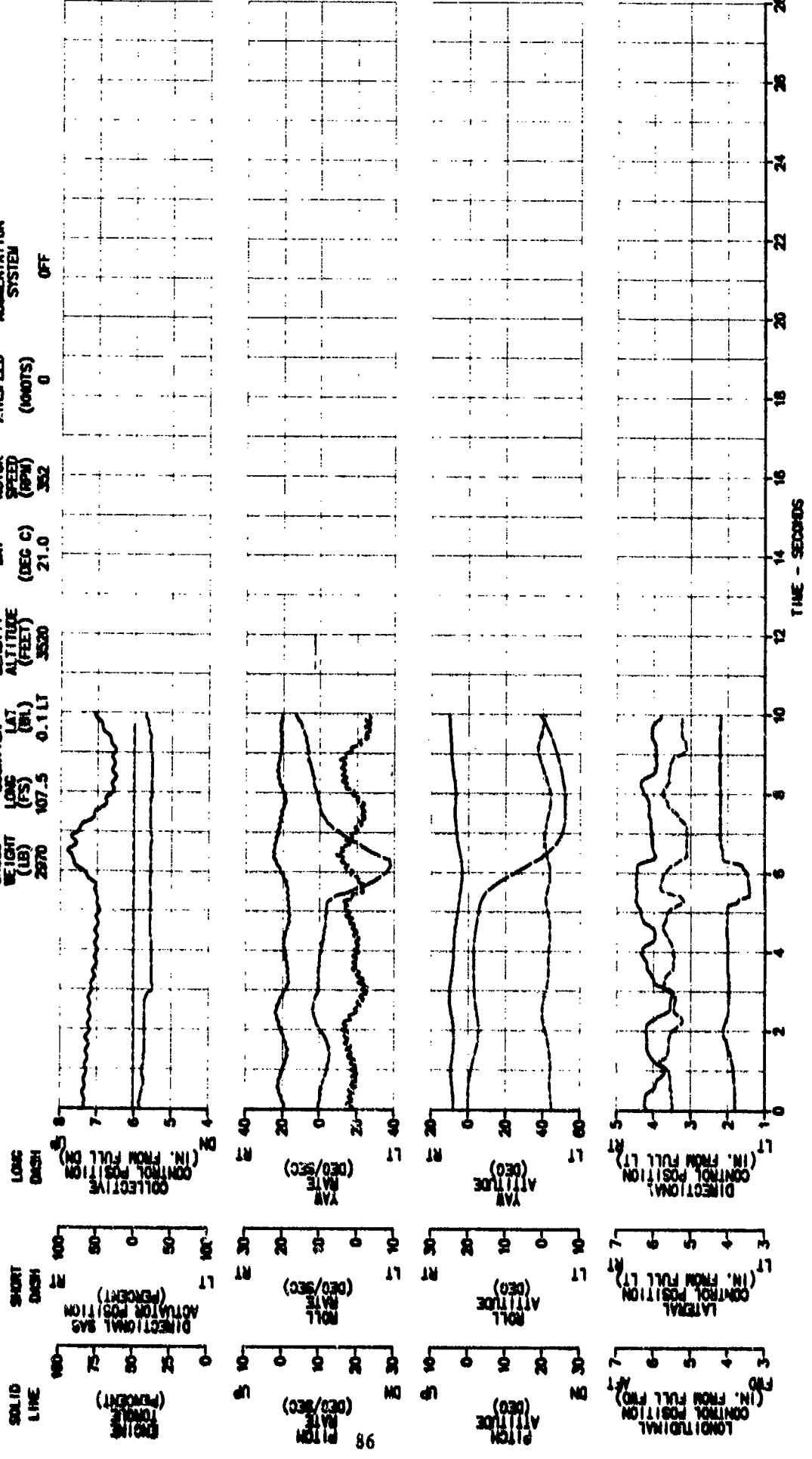


FIGURE E-51

RIGHT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JOH-50C USA S/N 70-15348

AVG GROSS WEIGHT (LB)	2970	AVG CG LONG (FS)	107.5	AVG CG LAT (BL)	0.1 LT	AVG DENSITY (DEG C)	20.5	AVG OAT (RPM)	353	TRIM SPEED (KNOTS)	0	TRUE AIRSPEED (KNOTS)	0	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	------------------	-------	-----------------	--------	---------------------	------	---------------	-----	--------------------	---	-----------------------	---	-------------------------------	----

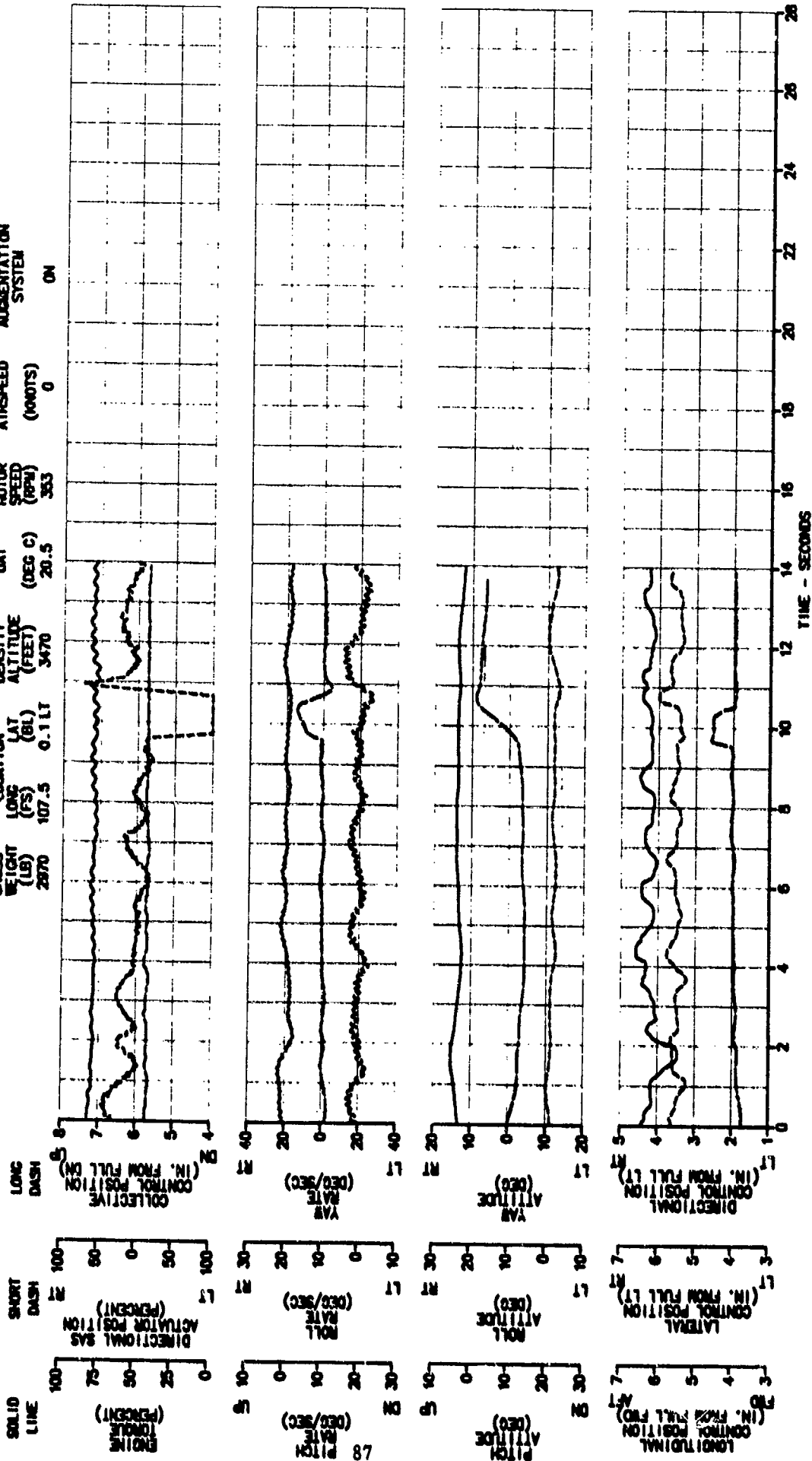


FIGURE E-32
RIGHT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JOH-50C USA S/N 70-15340
 TRUE AIRSPEED (KNOTS) 0
 STABILITY AUGMENTATION SYSTEM OFF
 TRIM ROTOR SPEED (RPM) 354
 AVG CS LAT (DEG C) 21.0
 AVG DENSITY ALT (FEET) 3560
 AVG LOCATION LONG (FS) 107.5 0.1 LT
 AVG GROSS WEIGHT (LB) 2970

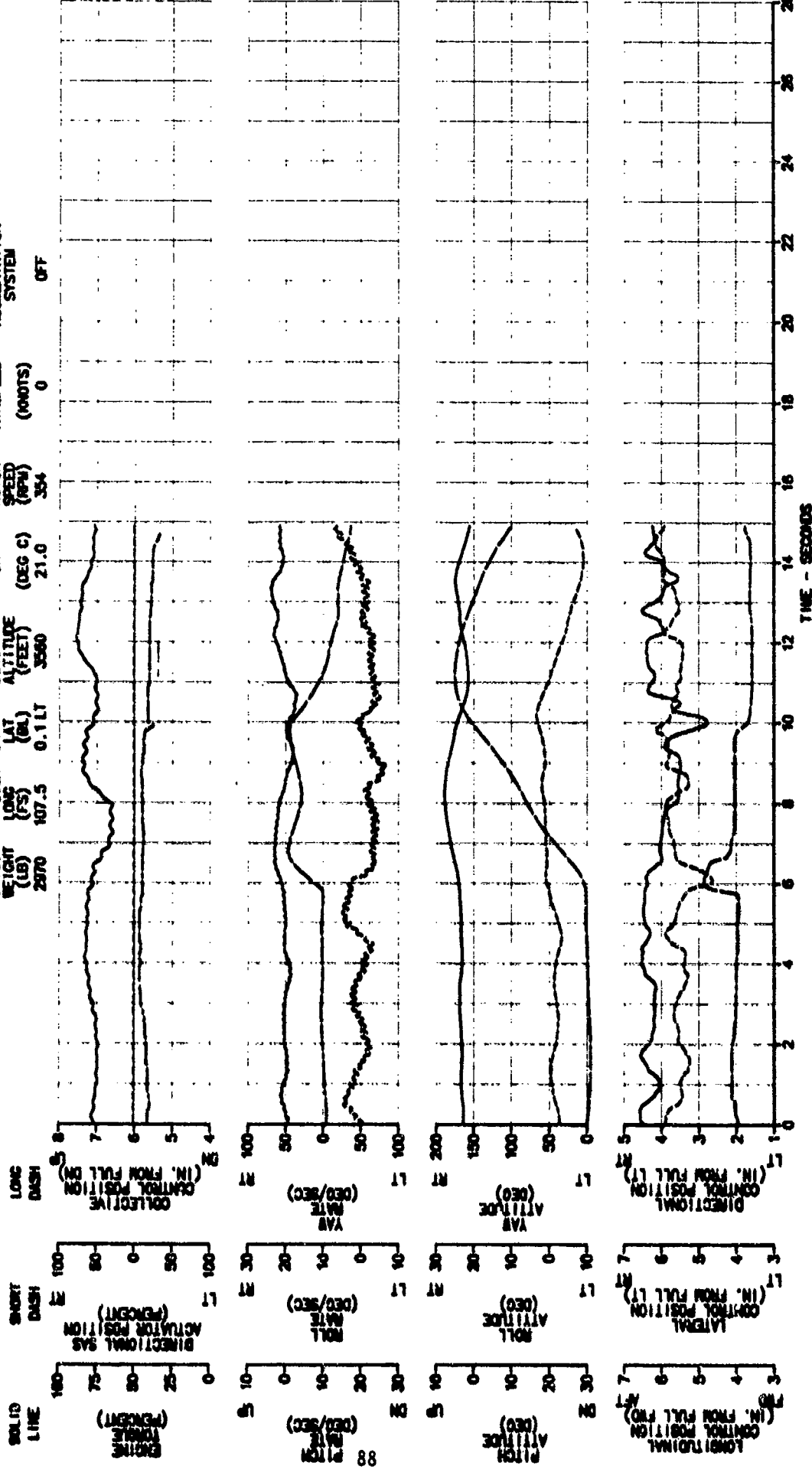


FIGURE E-53
LEFT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JOM-88C USA S/N 70-15349
 AVG CROSS WEIGHT (LB) 2880
 LONG (FS) 107.5
 LAT (BL) 0.1 LT
 AVG CS LOCATION
 DENSITY ALTITUDE (FEET) 3720
 AVG QAT (DEG C) 22.5
 TRIM ROTOR SPEED (RPM) 352
 TRUE AIRSPEED (KNOTS) 10
 STABILITY AUGMENTATION SYSTEM ON

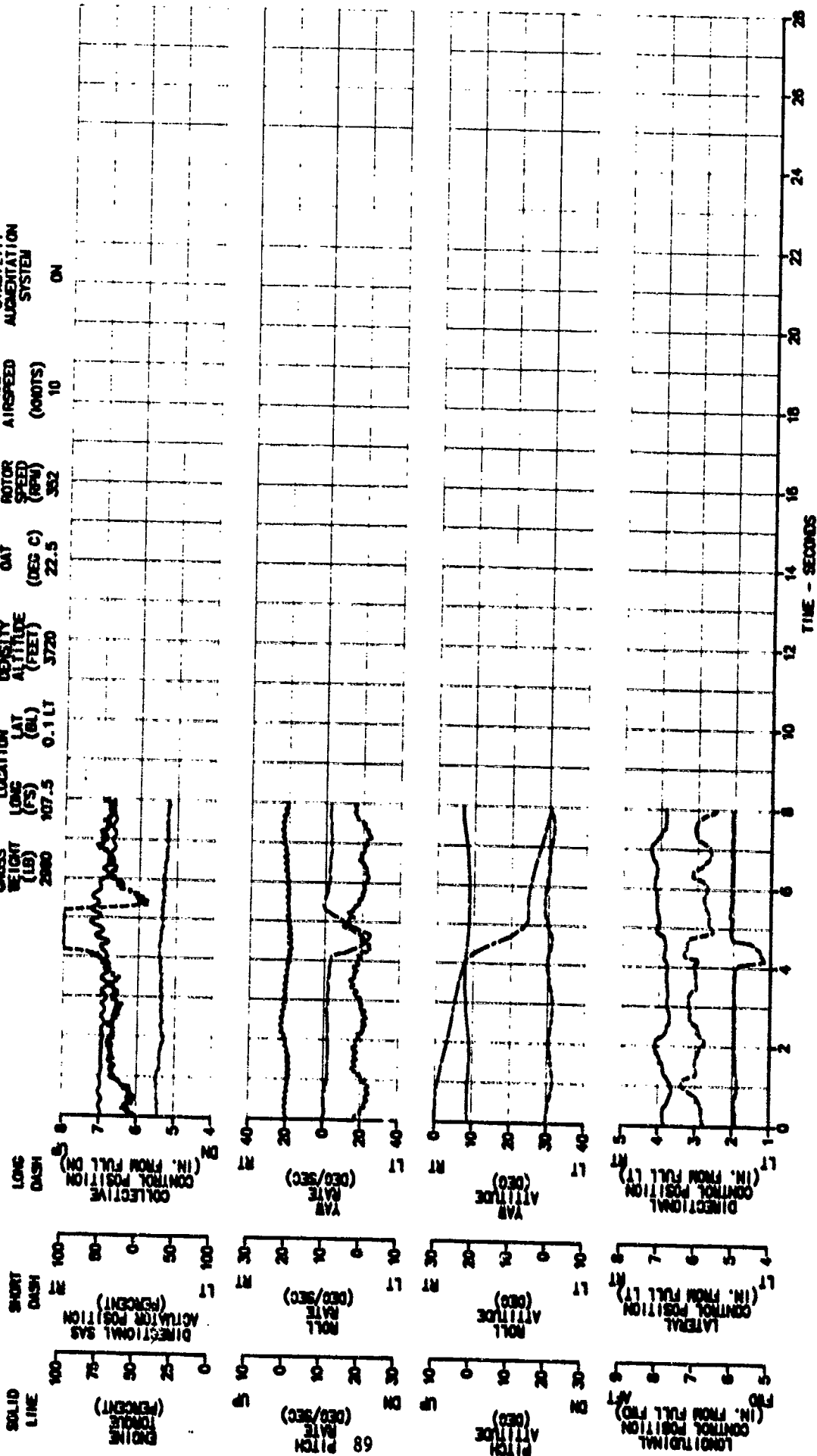


FIGURE E-54
LEFT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JOM-88C USA S/N 70-15348
 TRIM ROTOR SPEED 353
 TRUE AIRSPEED (KNOTS) 10
 STABILITY AUGMENTATION SYSTEM OFF
 AVG COG LAT (DEG C) 23.0
 AVG ALTITUDE (FEET) 3780
 AVG CROSS WEIGHT (LB) 2850
 LONG 107.5
 LAT (NM) -0.1 LT

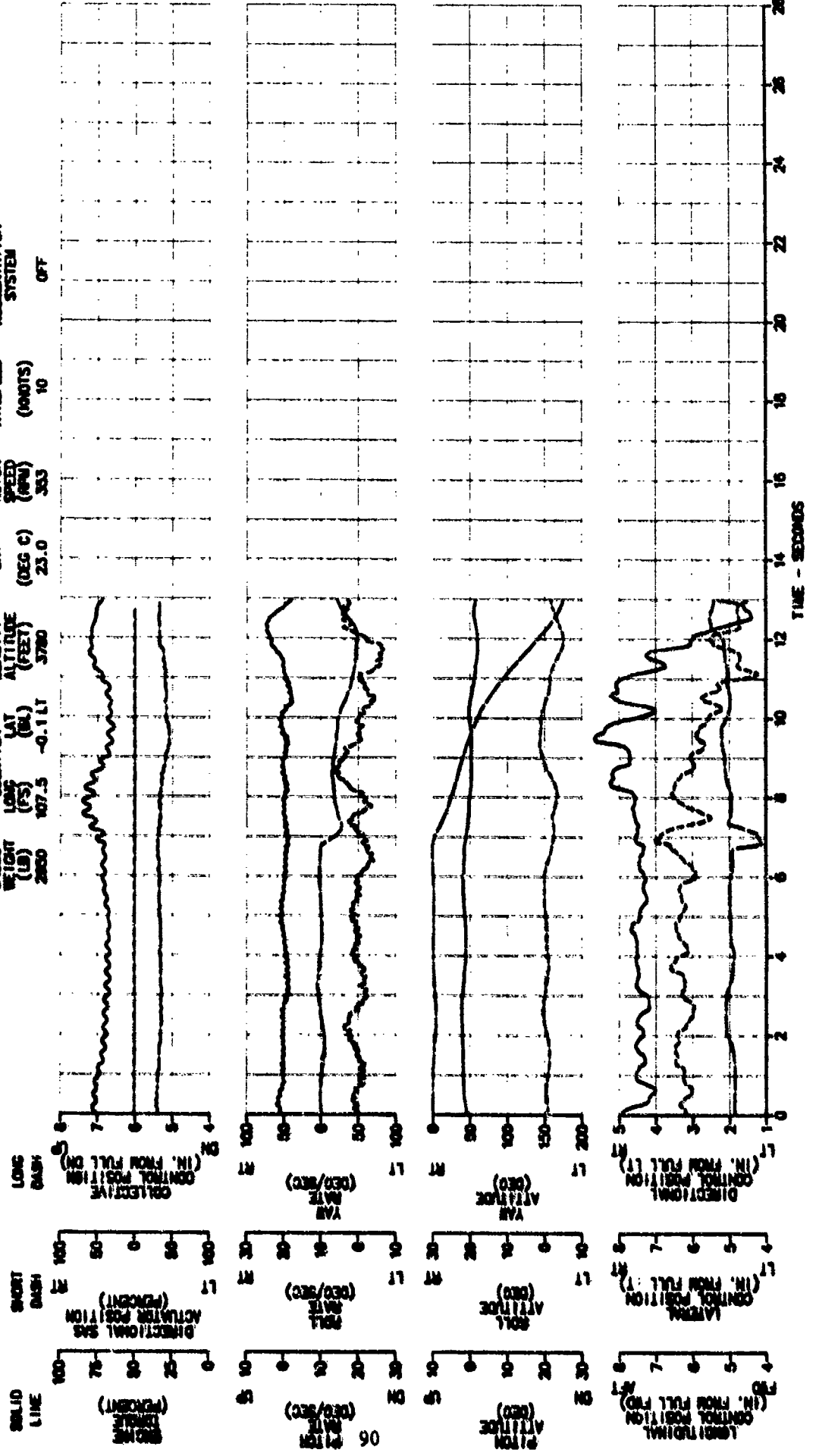


FIGURE E-55
RIGHT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JOM-88C USA S/N 70-15349
 TRIM ROTOR SPEED (RPM) 355
 TRUE AIRSPEED (KNOTS) 10
 STABILITY AUGMENTATION SYSTEM ON
 AVG CROSS WEIGHT (LB) 2800
 LONG (FS) 107.5
 LAT (ML) 0.1 LT
 AVG DENSITY QAT (DEG C) 23.0
 ALTITUDE (FEET) 3760

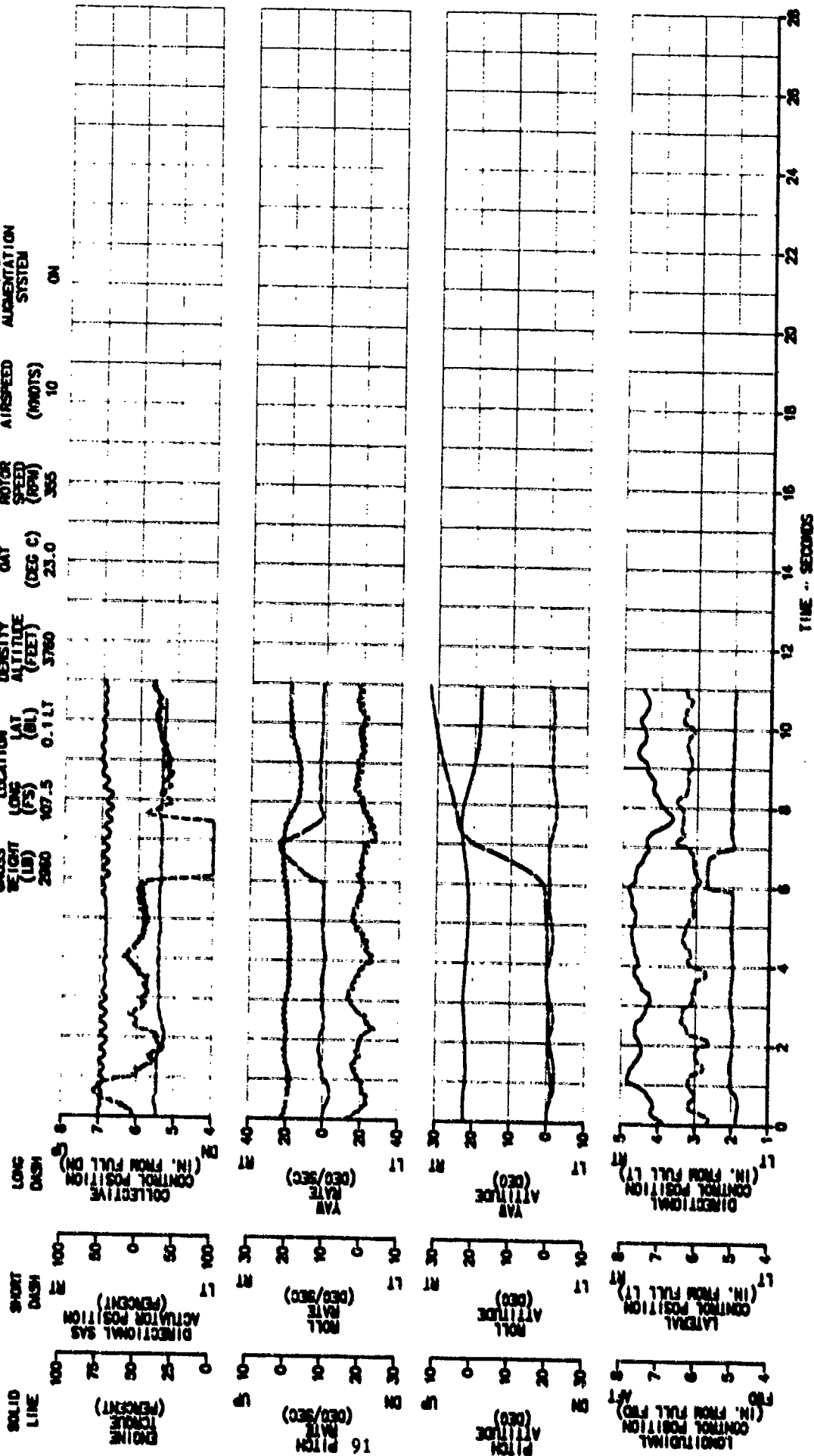
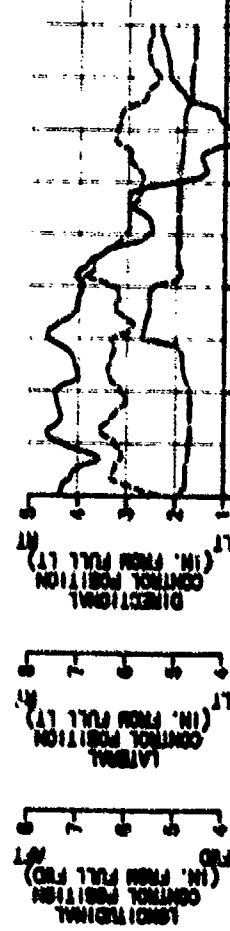
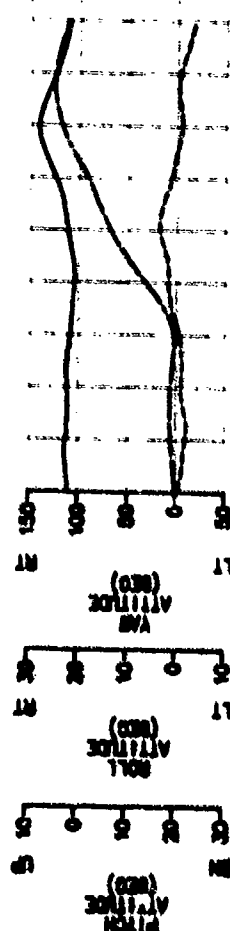
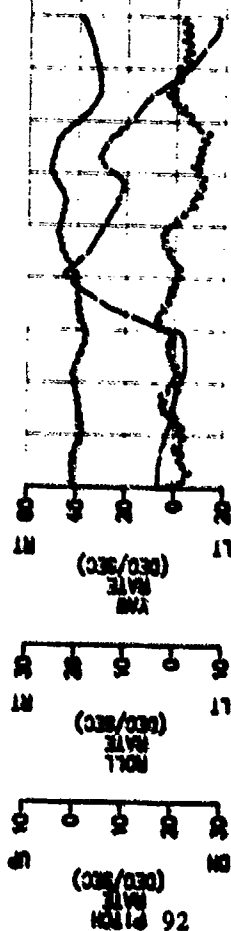
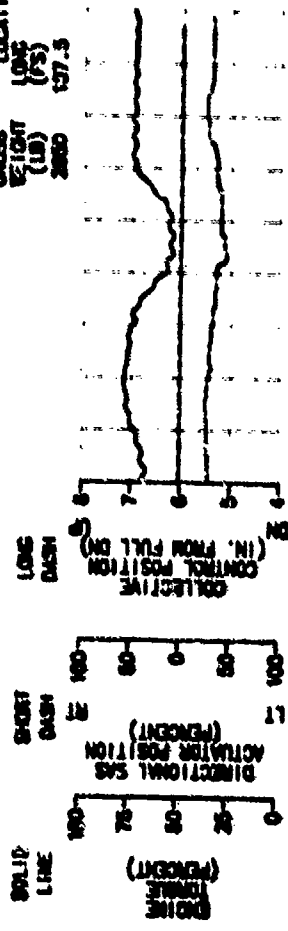


FIGURE E-56
RIGHT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH
JON-88C USA S/N 70-15349

AVG CROSS WEIGHT (LB) 2800
 AVG CS LOCATION LONG (75) 157.5 LAT (BL) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 3770
 AVG GAT (DEG C) 23.0
 TRIM MOTOR SPEED (RPM) 352
 TRUE AIRSPEED (KNOTS) 10
 STABILITY AUGMENTATION SYSTEM OFF



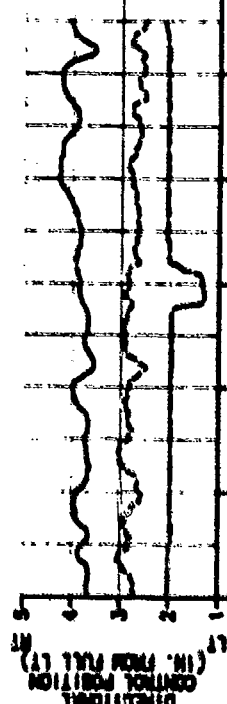
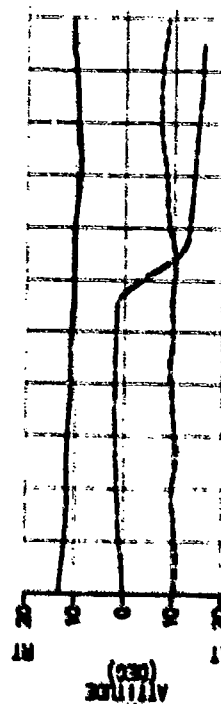
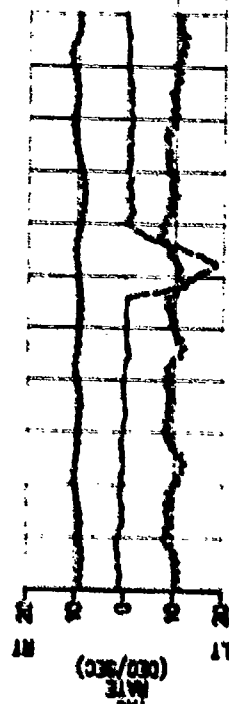
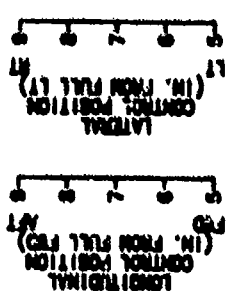
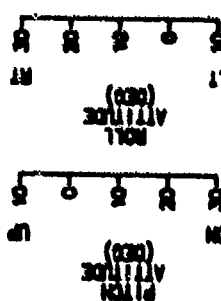
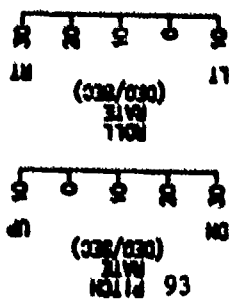
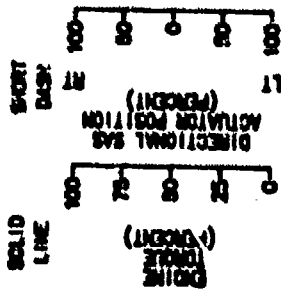
TIME - SECONDS

FIGURE E-57

LEFT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JOM-20C USA S/N 70-15348

AVG CS LOCATION		AVG ALTITUDE (FEET)		AVG DENSITY OAT		TRIM		TRUE AIRSPEED (KNOTS)		STABILITY AUGMENTATION SYSTEM	
LONG (°E)	LAT (°N)	ALTITUDE	DENSITY	OAT	SPEED	TRIM	ROTOR SPEED	AIRSPEED	(KNOTS)	SYSTEM	ON
107.5	0.11	3870		22.0	352			20			



TIME - SECONDS

FIGURE E-58

LEFT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JOH-REC-SEA S/N 70-18348

AVG ORBS WEIGHT (LB)	2800	AVG CC LOCATION	0.1 LT	AVG ALTITUDE (FEET)	3500	AVG QAT	21.5	TRIM	353	TRUE AIRSPEED (KNOTS)	21	STABILITY AUGMENTATION SYSTEM	OFF
----------------------	------	-----------------	--------	---------------------	------	---------	------	------	-----	-----------------------	----	-------------------------------	-----

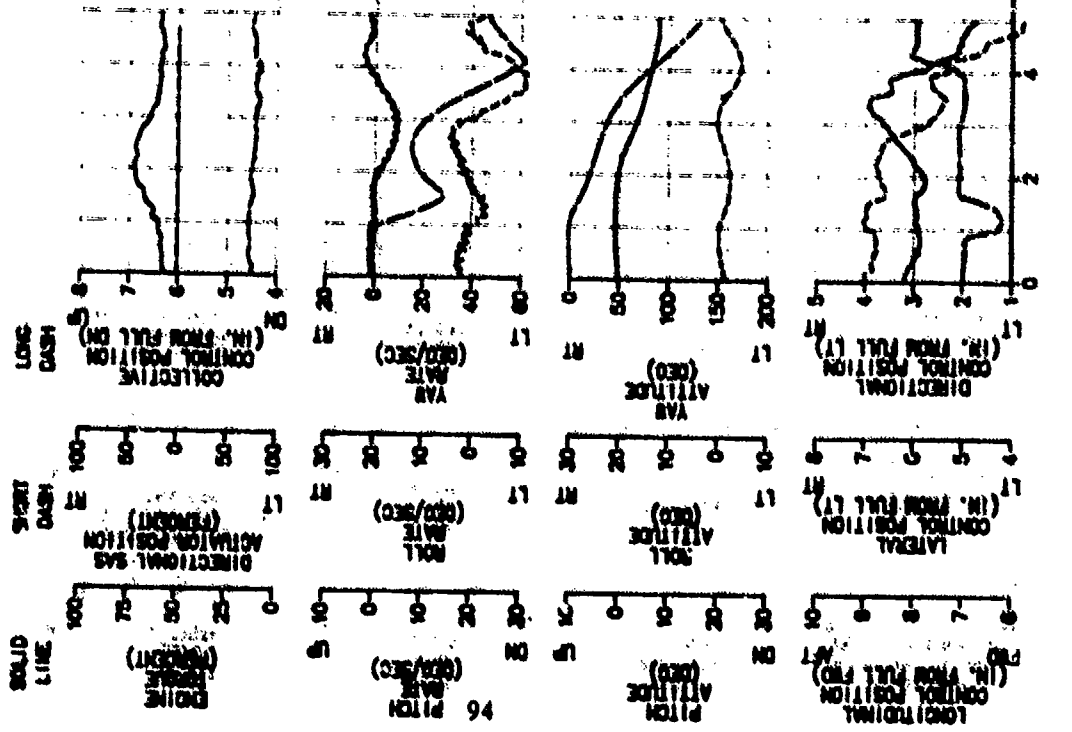


FIGURE E-50
RIGHT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JOH-ORC USA S/N 70-15348
 TRUE AIRSPEED (KNOTS) 20
 STABILITY AUGMENTATION SYSTEM ON
 TRIM ROTOR SPEED (RPM) 353
 AVG DENSITY ALT (DEG C) 21.0
 AVG ALTITUDE (FEET) 3560
 AVG CG LOCATION (IN) 107.1
 LAT (ML) 0.1 LT

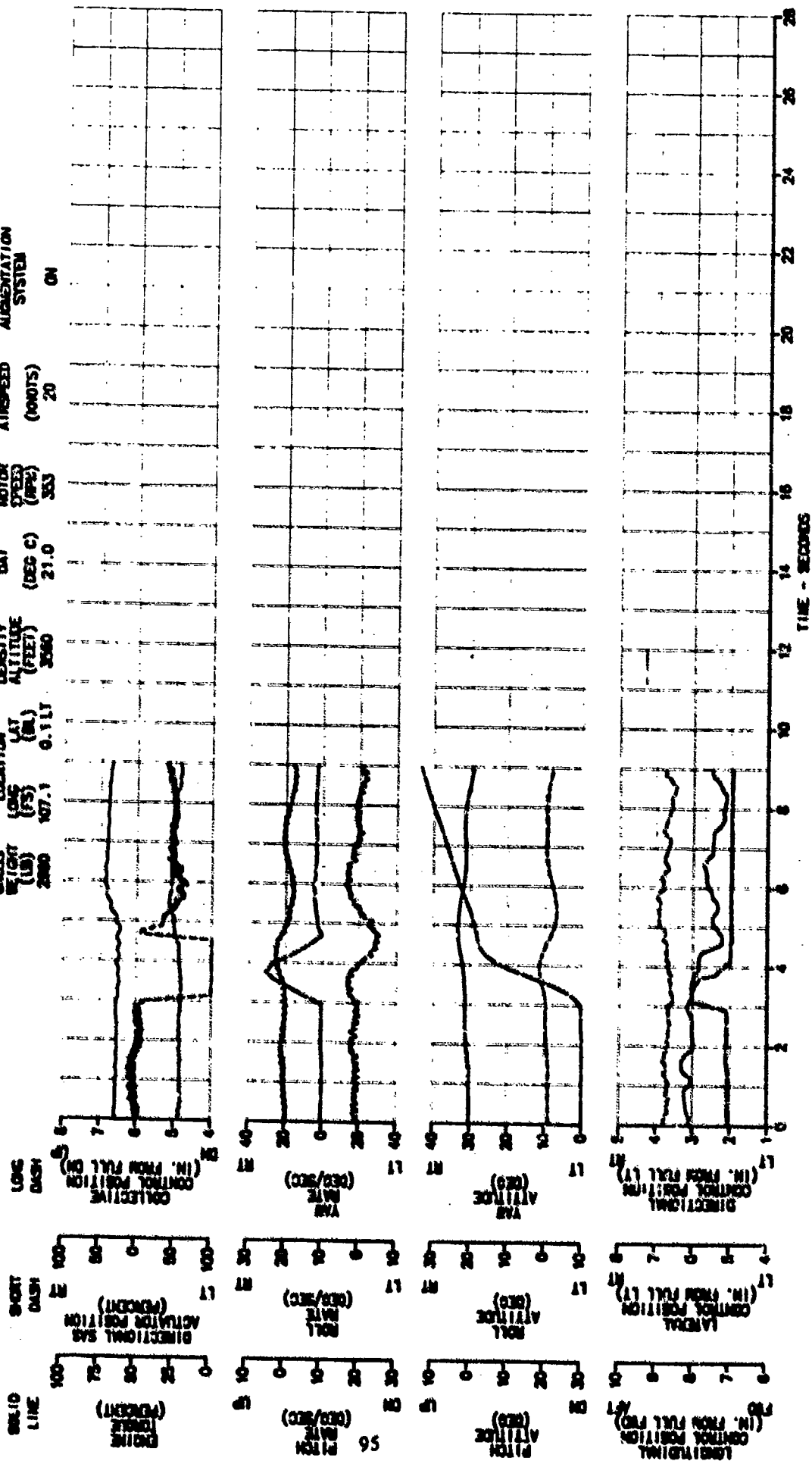


FIGURE E-80
RIGHT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JDA-88C UEA S/N 70-15348
 TRIM BOTOM SPEED (RPM) 363
 TRUE AIRSPEED (KNOTS) 20
 STABILITY AUGMENTATION SYSTEM OFF
 AVG CROSS WEIGHT (LB) 2800
 AVG CS LOCATION LONG (°S) 107.1 LAT (°N) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 2780
 AVG DAY (DEG C) 21.0

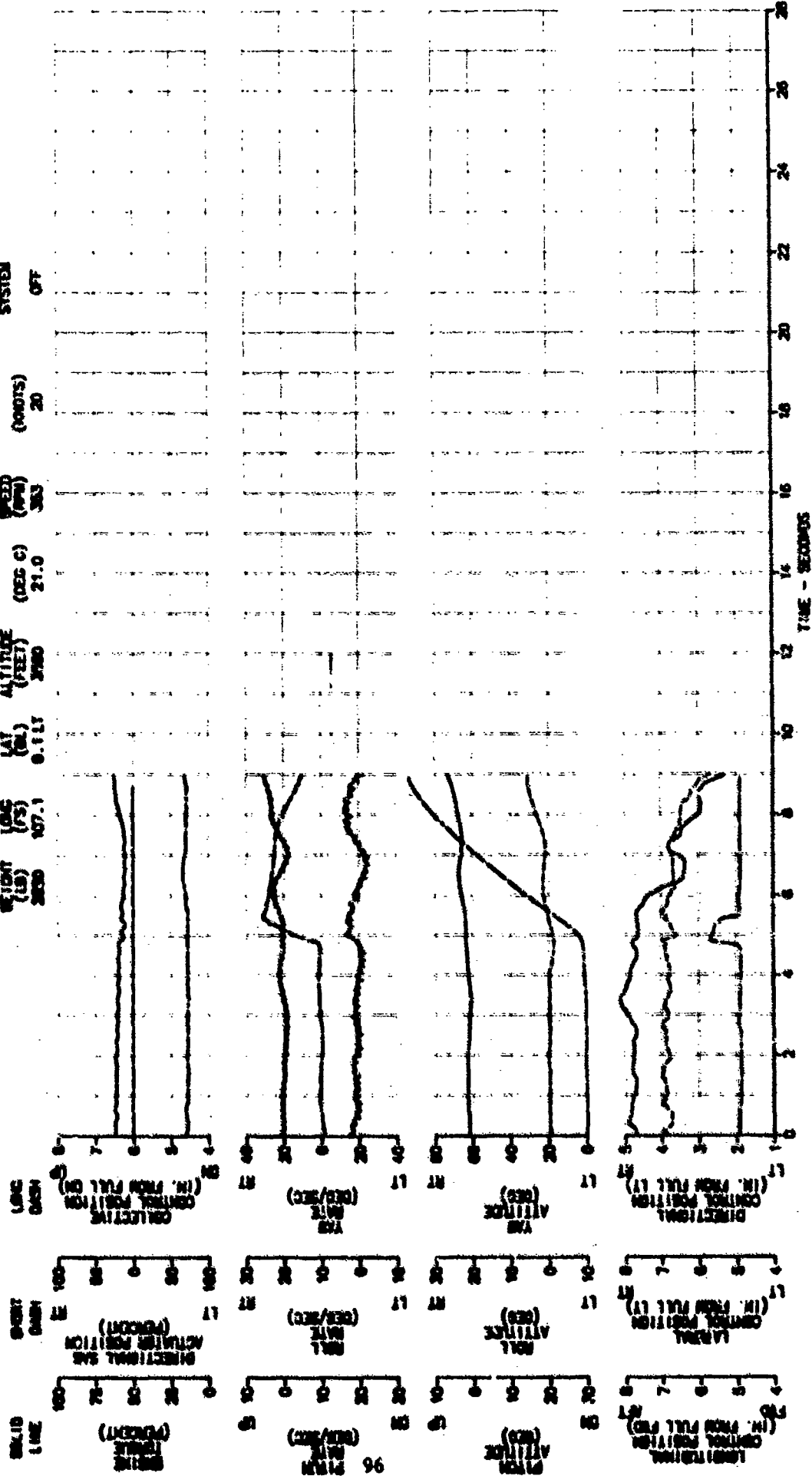


FIGURE 1-41
LEFT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JOM-ONE USA S/N 26-14348
 TRUE AIRSPEED (KNOTS) 30
 STABILITY AUGMENTATION SYSTEM ON
 AVE CROSS WEIGHT (LB) 2800
 AVE CS LOCATION LAT (N) 0.11
 AVE ALTITUDE (FEET) 20.5
 AVE DENSITY (G/CM³) 0.0012
 AVE ALTITUDE (FEET) 20.5
 AVE DENSITY (G/CM³) 0.0012

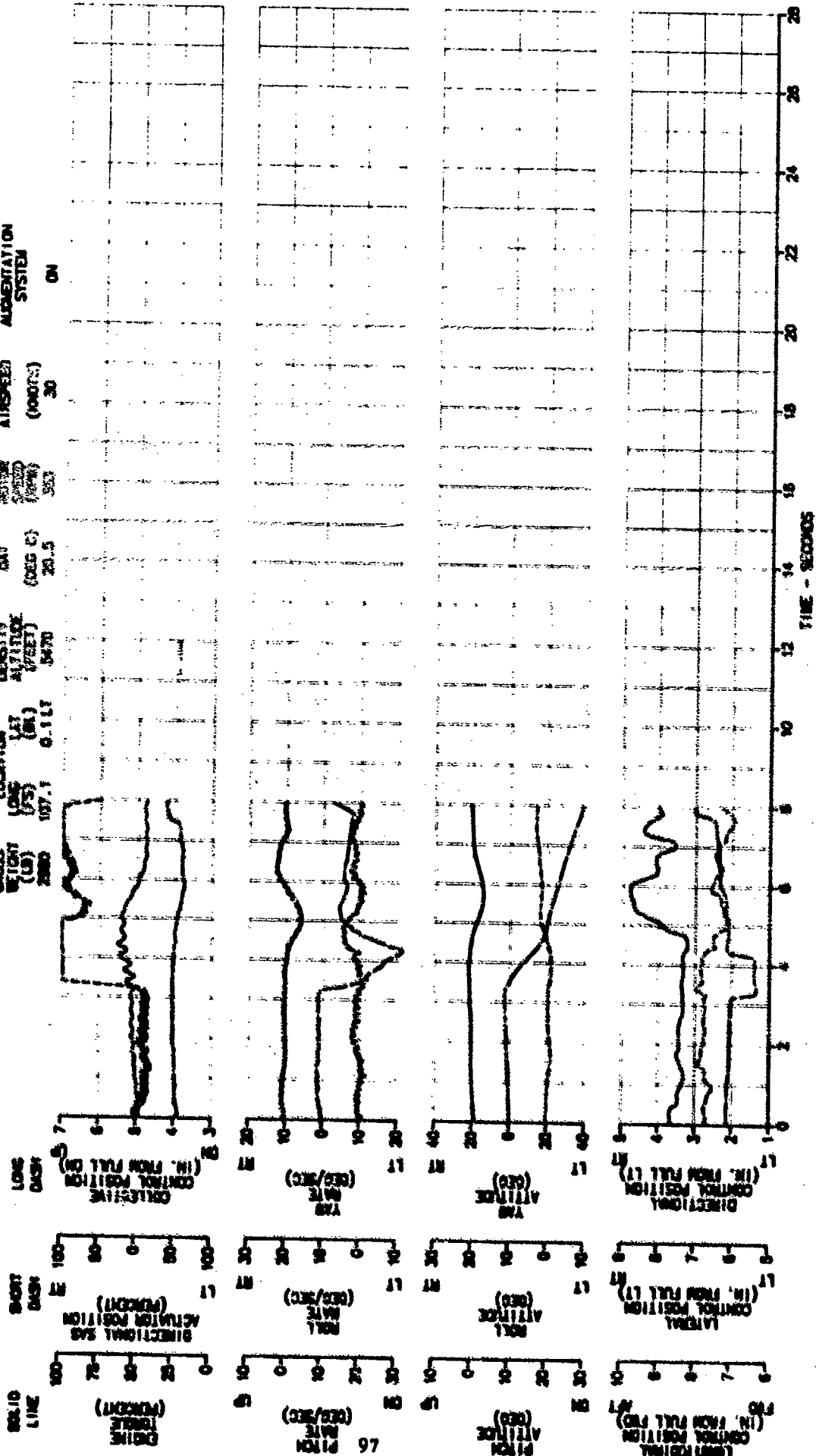


FIGURE E-82

LEFT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JCH-58C USA S/W 70-13349
 STABILITY AUGMENTATION SYSTEM OFF
 TRUE AIRSPEED (KNOTS) 30
 TRIM MOTOR SPEED (RPM) 353
 AVG DENSITY (GAT) 21.0 (DEG C)
 ALTITUDE (FEET) 3500
 LAT (BL) 0.1 LT
 LONG 107.0
 AVG CROSS WEIGHT (LB) 2570

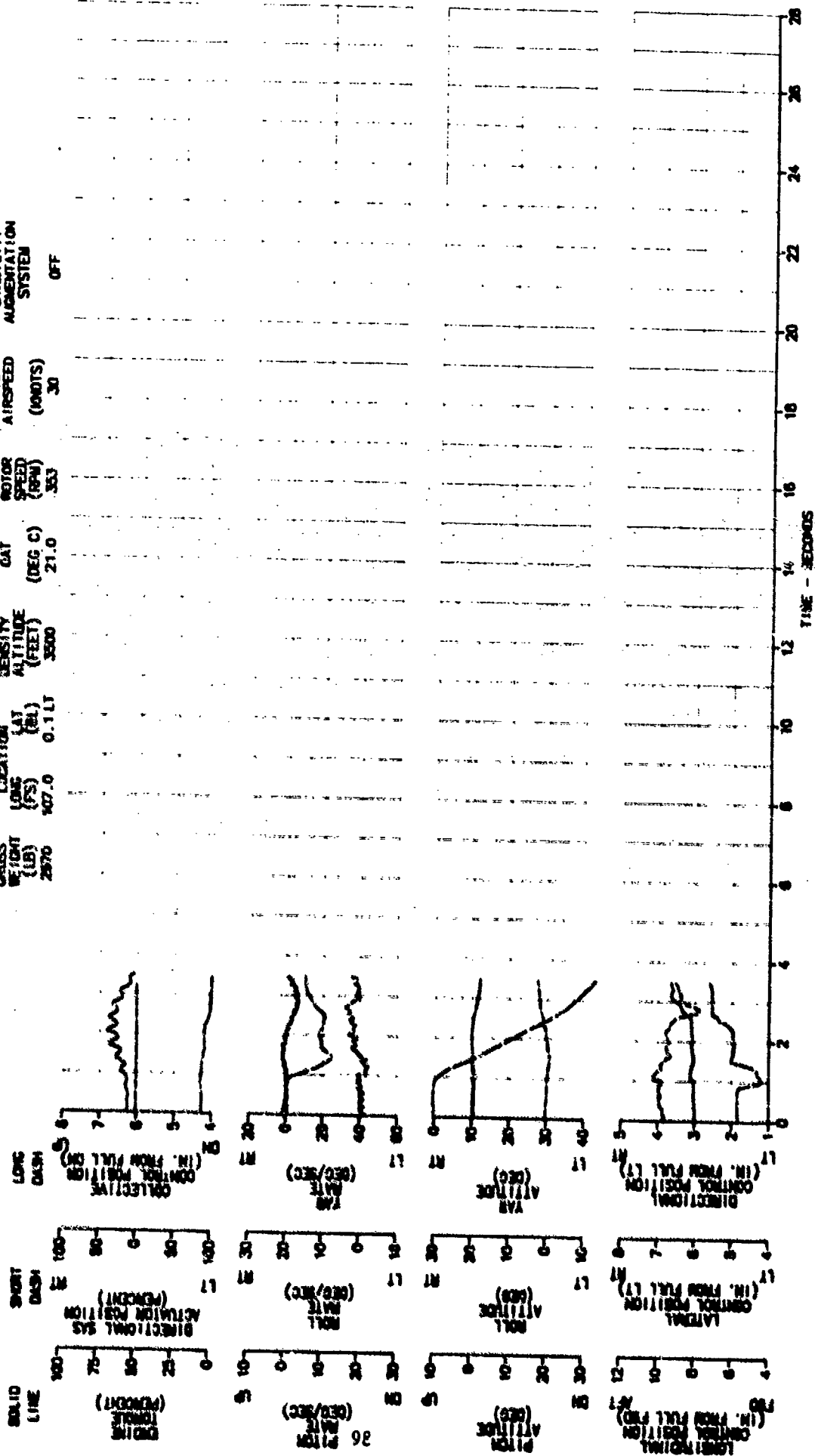


FIGURE E-83
RIGHT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JON-58C USA S/M 70-15349

AVG CROSS WEIGHT (LB)	107.0	AVG CS LOCATION (PS)	0.117	AVG DENSITY ALTITUDE (FEET)	3540	AVG DAT (DEG C)	21.0	TRIM ROTOR SPEED (RPM)	382	TRUE AIRSPEED (KNOTS)	27	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	-------	----------------------	-------	-----------------------------	------	-----------------	------	------------------------	-----	-----------------------	----	-------------------------------	----

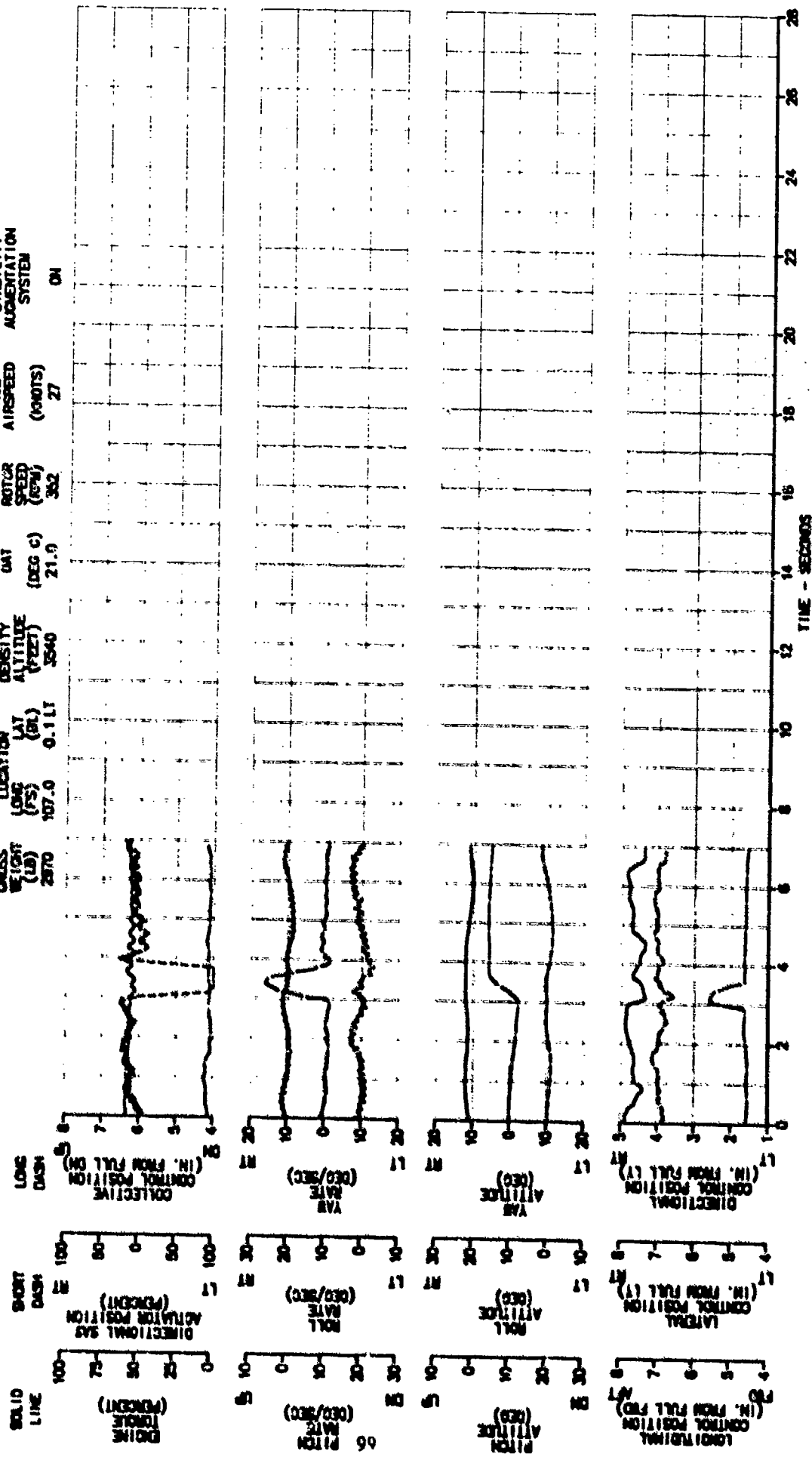


FIGURE E-64
RIGHT DIRECTIONAL PULSE INPUT - 150 DEGREE AZIMUTH

JOH-586 USA S/N 79-15348
 AVG CROSS WEIGHT (LB) 2500
 AVG CG LONG (FT) 107.0
 LAT (BL) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 3530
 AVG OAT (DEG C) 21.0
 TRIM MOTOR SPEED (RPM) 304
 TRUE AIRSPEED (KNOTS) 30
 STABILITY AUGMENTATION SYSTEM OFF

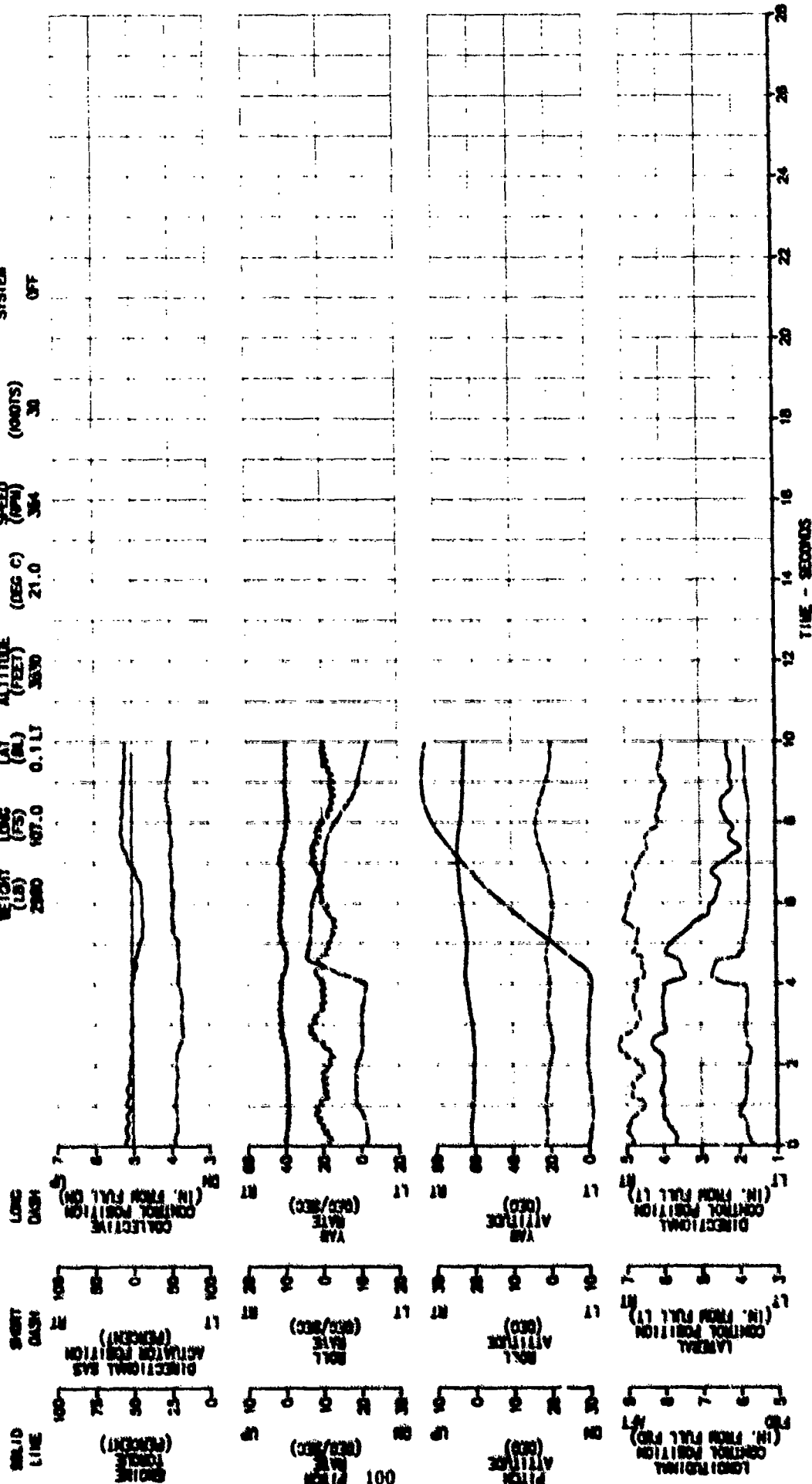


FIGURE E-65
LEFT DIRECTIONAL PULSE INPUT - 180 DEGREE AZIMUTH

JOM-58C USA S/N 70-15349
 TRIM ROTOR SPEED (RPM) 343
 STABILITY AUGMENTATION SYSTEM ON
 TRLE AIRSPEED (KNOTS) 0
 AVG CS LOCATION LAT (BL) 3.1 LT
 AVG CROSS WEIGHT (LB) 2880
 LONG (FS) 107.0
 ALTITUDE (FEET) 3570
 DEG C 21.0

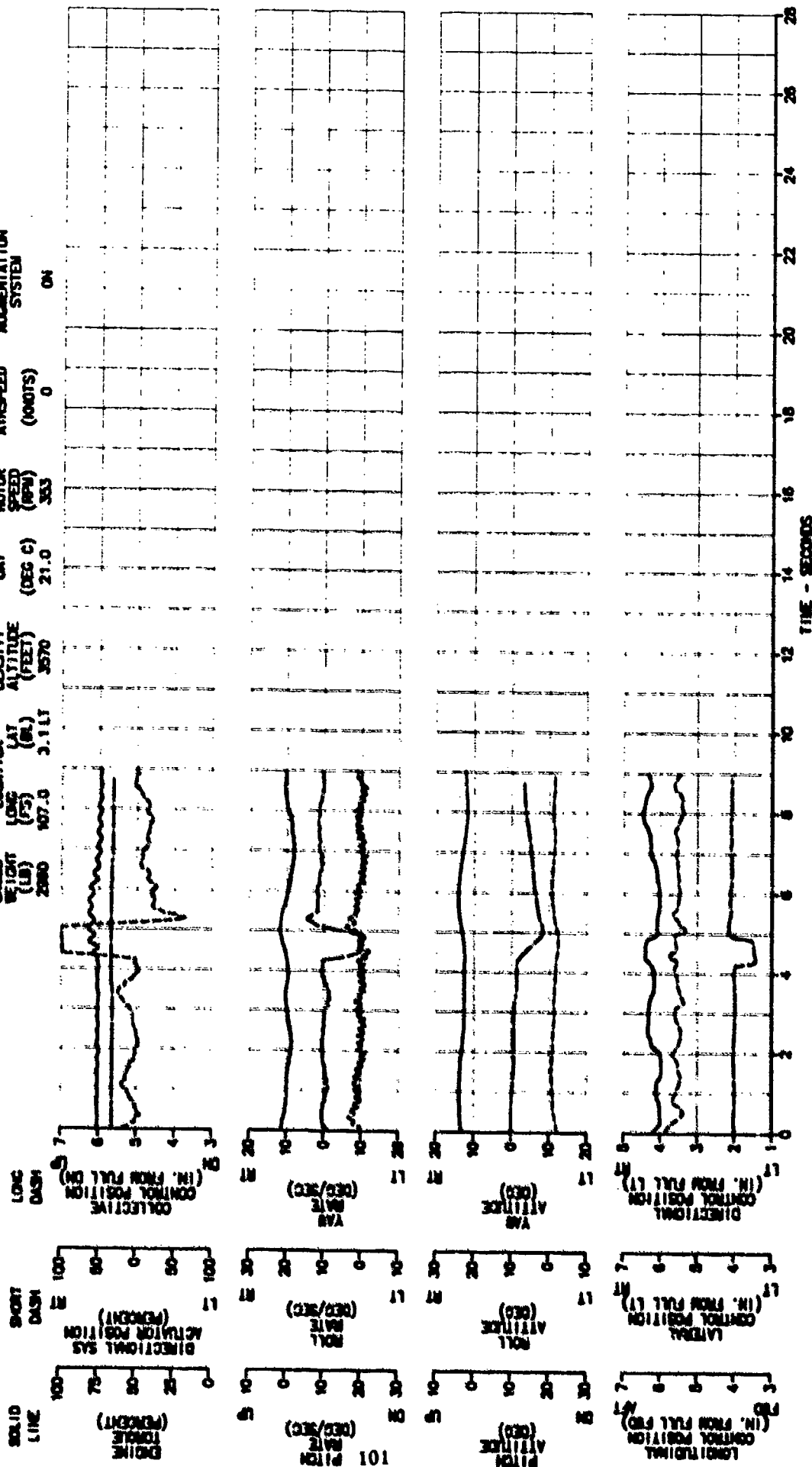


FIGURE E-68
LEFT DIRECTIONAL PULSE INPUT - 100 DEGREE AZIMUTH

JOH-ONE USA S/N 70-15340
 TRIM ROTOR SPEED (RPM) 303
 STABILITY AUGMENTATION SYSTEM OFF
 TRUE AIRSPEED (KNOTS) 0
 AVG ALTITUDE (FEET) 21.5
 AVG DENSITY ALTITUDE (FEET) 3000
 AVG CS LAT (ML) 0.1 LT
 AVG CS LONG (PS) 0.1 LT
 AVG CS WEIGHT (LB) 2000

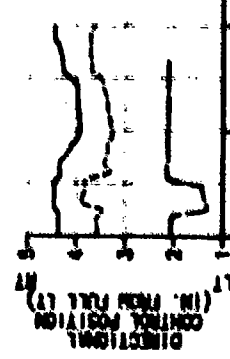
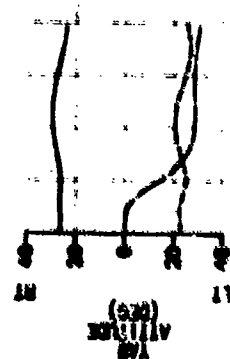
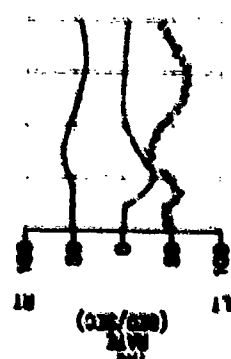
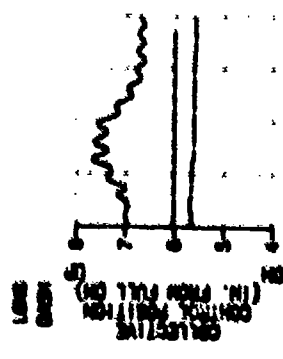
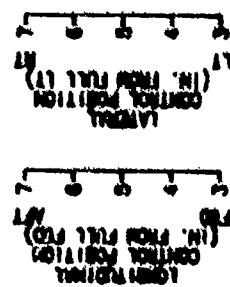
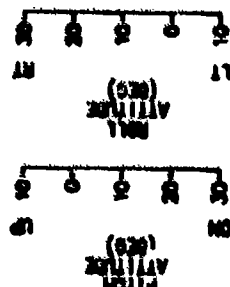
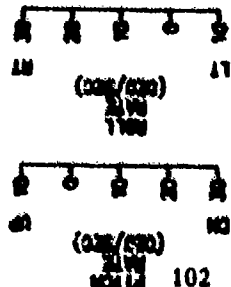
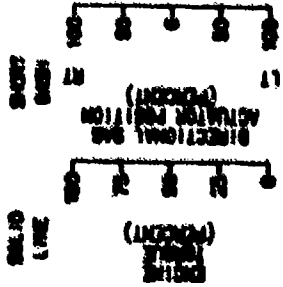
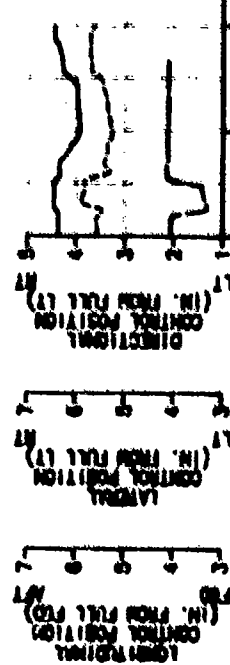
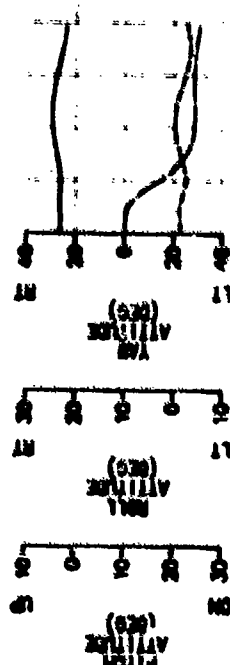
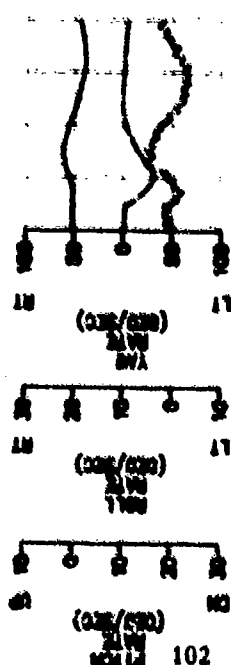
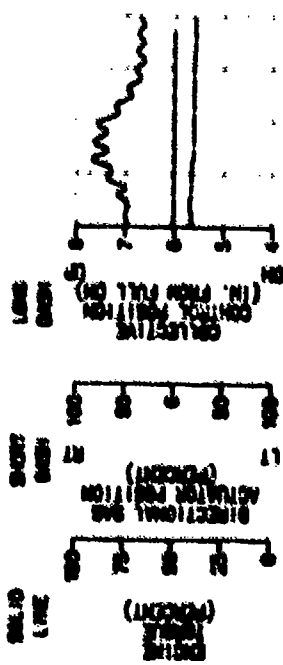


FIGURE E-67

RIGHT DIRECTIONAL PULSE INPUT - 180 DEGREE AZIMUTH

JDA-58C USA S/M 70-15349

AVG CROSS WEIGHT (LB) 2800
 AVG CG LONG (FT) 507.0
 LAT (ML) 0.1 LT
 DENSITY ALTITUDE (FEET) 3000
 AVG QAT (DEG C) 21.5
 TRIM ROTOR SPEED (RPM) 303
 TRUE AIRSPEED (KNOTS) 0
 STABILITY AUGMENTATION SYSTEM ON

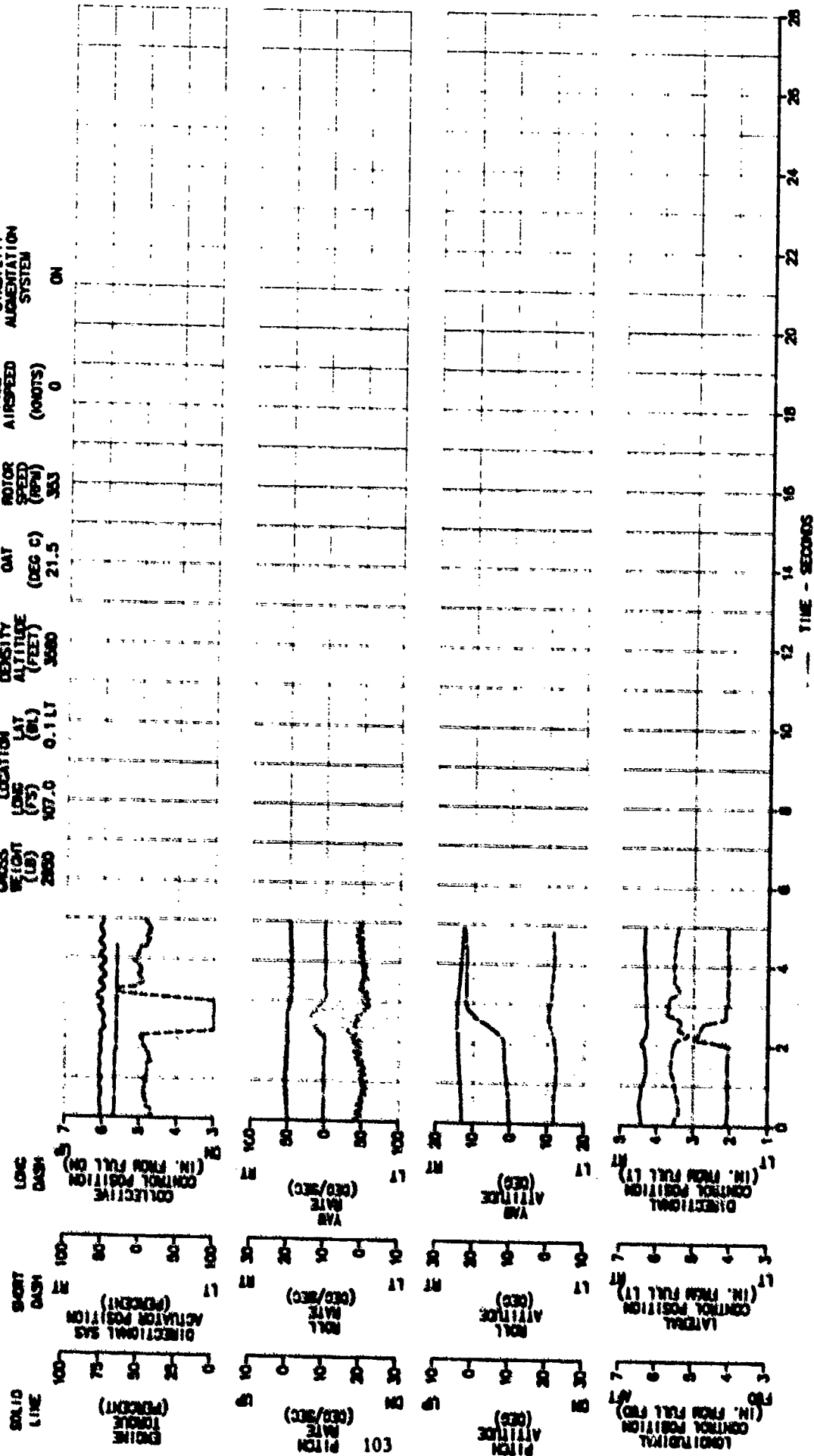


FIGURE E-66
RIGHT DIRECTIONAL PULSE INPUT - 180 DEGREE AZIMUTH

J01-50C USA S/N 70-15340

AVG WEIGHT (LB)	2000	AVG CS LONG (PS)	107.0	AVG CS LAT (IN)	0.1 LT	AVG DENSITY (DEG C)	21.5	AVG ROTOR SPEED (RPM)	353	TRUE AIRSPEED (KNOTS)	0	STABILITY AUGMENTATION SYSTEM	OFF
-----------------	------	------------------	-------	-----------------	--------	---------------------	------	-----------------------	-----	-----------------------	---	-------------------------------	-----

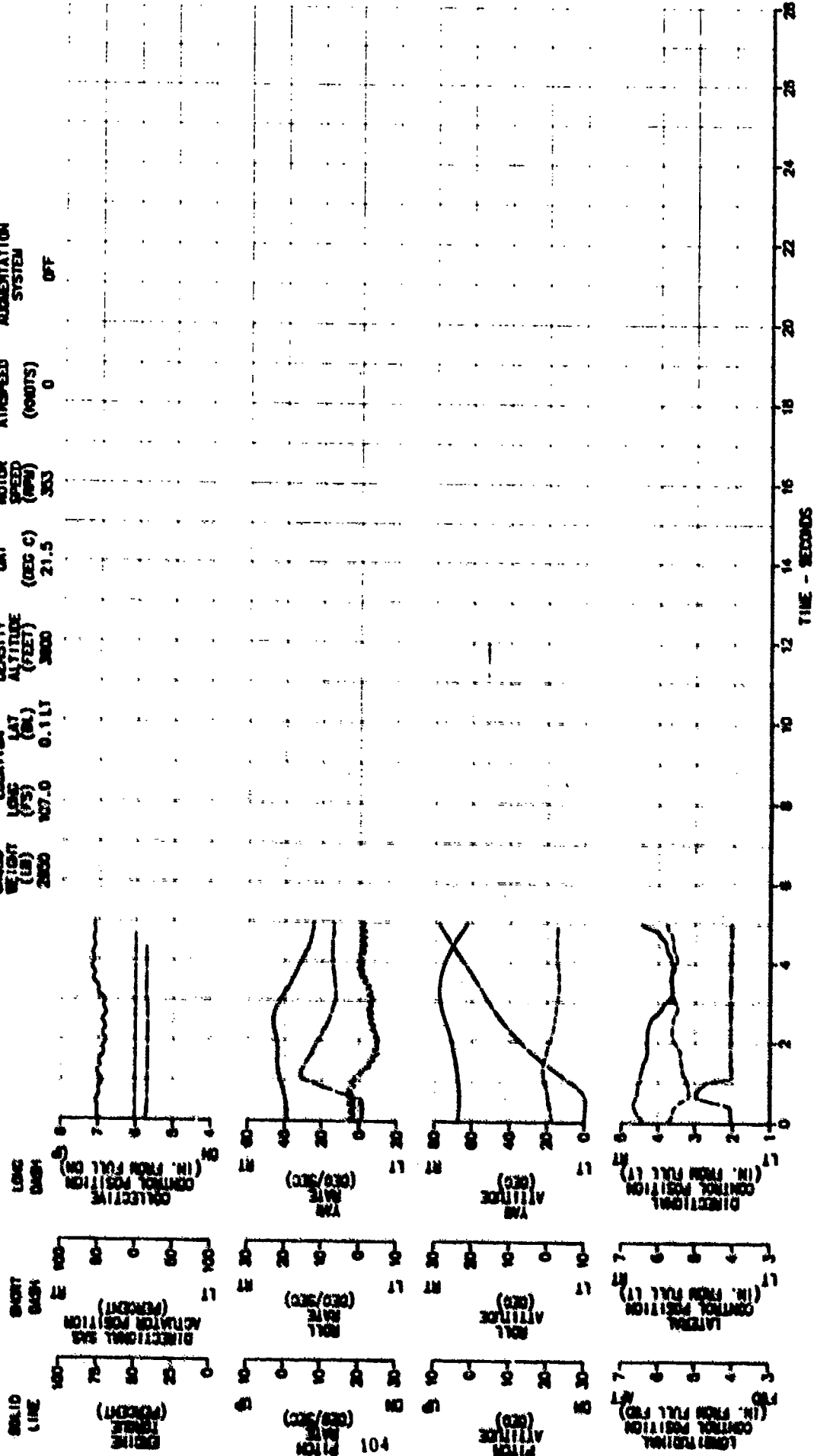


FIGURE E-89
LEFT DIRECTIONAL PULSE INPUT - 180 DEGREE AZIMUTH

JOH-58C USA S/N 70-15348

STABILITY
AUGMENTATION
SYSTEM
ON

TRUE
AIRSPEED
(KNOTS)
10

TRIN
ROTOR
SPEED
(RPM)
365

AVG
QAT
(DEG C)
24.0

AVG
DENSITY
ALTITUDE
(FEET)
3650

AVG CG
LOCATION
LAT
(DEG)
0.1 LT

AVG CG
WEIGHT
(LB)
3000

AVG
DASH
CONTROL POSITION
(IN. FROM FULL ON)

AVG
DASH
CONTROL POSITION
(IN. FROM FULL LT)

AVG
DASH
CONTROL POSITION
(IN. FROM FULL PRO)

AVG
DASH
CONTROL POSITION
(IN. FROM FULL LT)

AVG
DASH
CONTROL POSITION
(IN. FROM FULL LT)

AVG
DASH
CONTROL POSITION
(IN. FROM FULL LT)

AVG
DASH
CONTROL POSITION
(IN. FROM FULL LT)

AVG
DASH
CONTROL POSITION
(IN. FROM FULL LT)

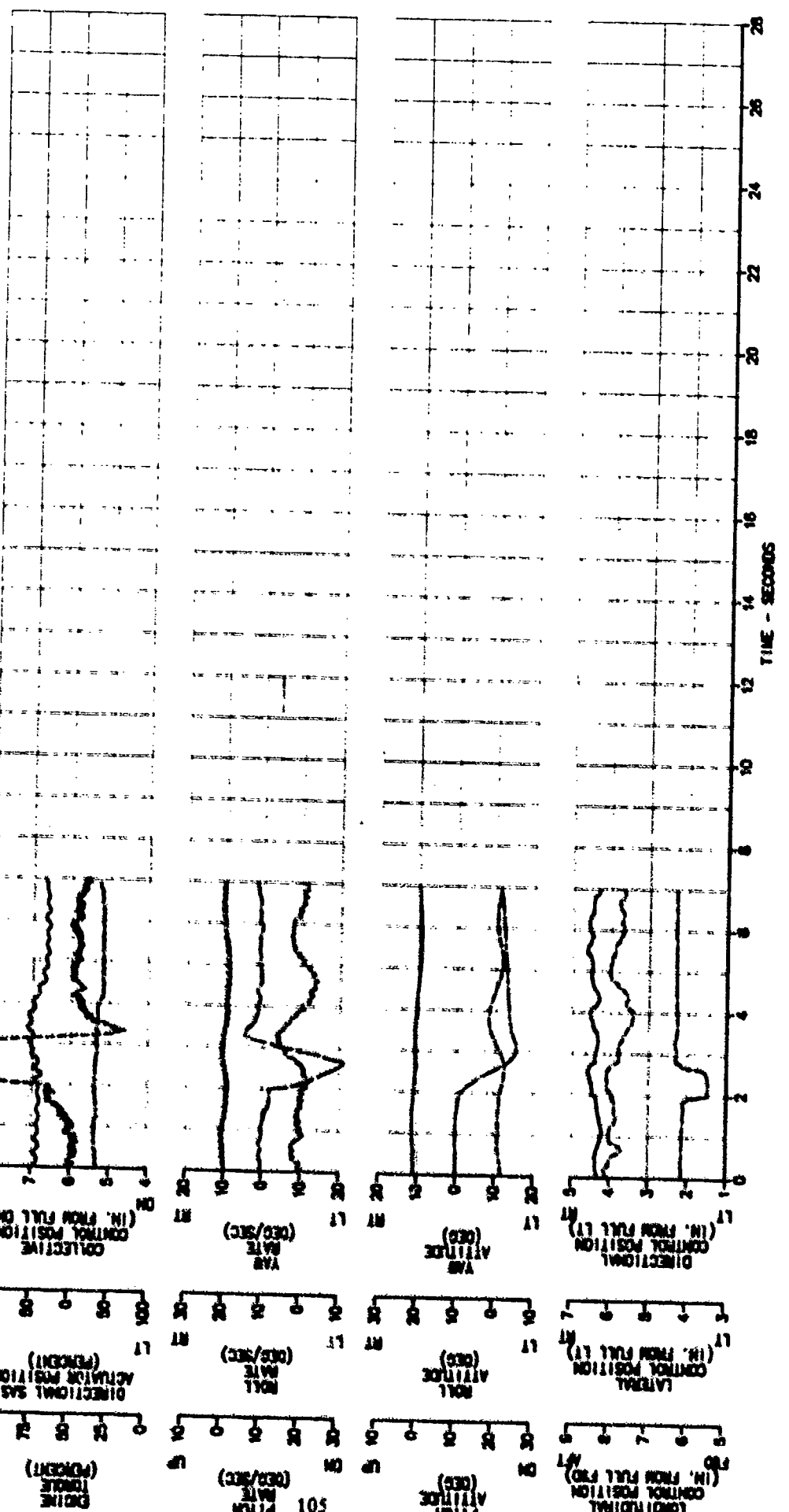


FIGURE E-70
LEFT DIRECTIONAL PULSE INPUT - 180 DEGREE AZIMUTH

AIRC	LOC	ALT	DEN	QAT	TRM	TRE	STA
MODE	(PS)	(FEET)	(G/G)	(DEG C)	(RPM)	ALIGNED	BUMENTATION
800.6	0.1 LT	6750	28.5	351	10	OFF	

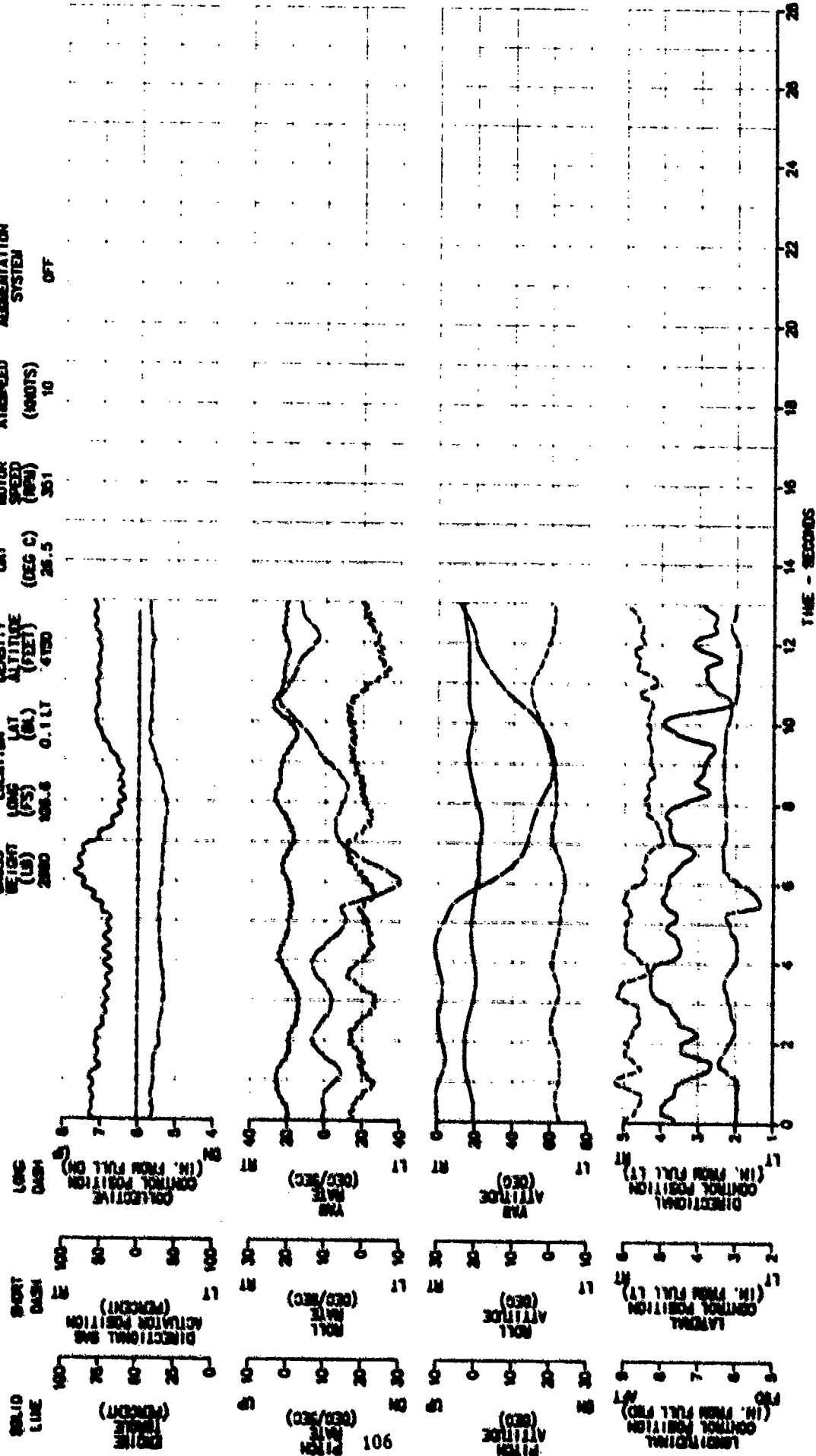


FIGURE E-71

RIGHT DIRECTIONAL PULSE INPUT - 100 DEGREE AZIMUTH

JOM-58C USA S/N 70-15349

Avg CG	Avg Density	Avg GAT	TRIM	TYPE	STABILITY
LOC (°S)	ALTITUDE (FEET)	(DEG C)	SPEED (KPH)	AIRFEED	AUGMENTATION
108.6	4070	25.5	353	(NOOTS)	SYSTEM
0.1 LT				10	UN

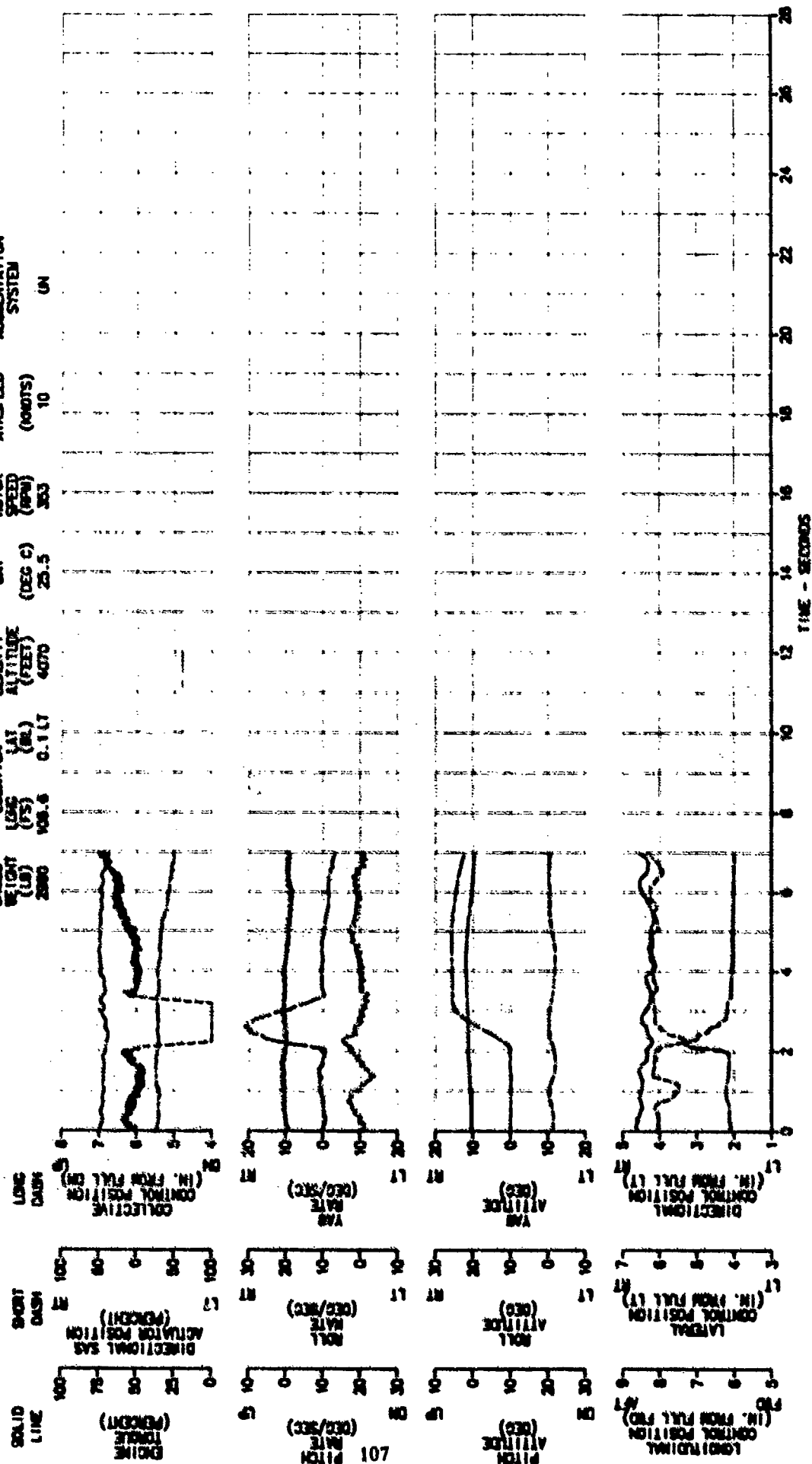


FIGURE E-72
RIGHT DIRECTIONAL PULSE INPUT - 100 DEGREE AZIMUTH

AVG CROSS WEIGHT (LB) 2000
 AVG CR LOCATION (FT) 100.5
 DENSITY (G/CC) 0.11
 ALTITUDE (FEET) 4000
 TRUE AIRSPEED (KNOTS) 27.0
 TRUE ALTITUDE (KNOTS) 10
 STABILITY AUGMENTATION SYSTEM OFF

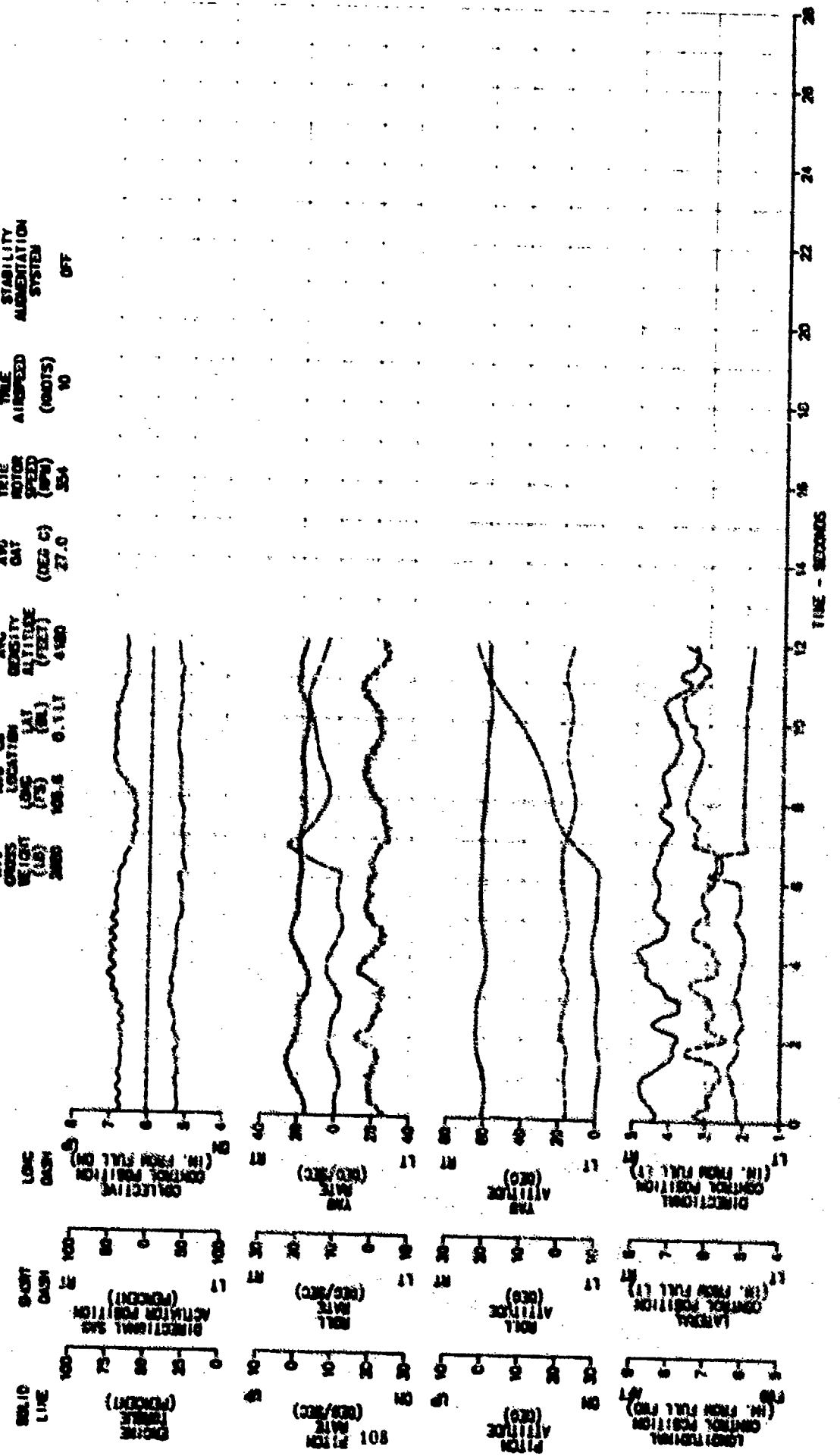


FIGURE C-73
LEFT DIRECTIONAL PULSE INPUT - 180 DEGREE AZIMUTH

JDA-90C USA S/N 70-15349

TRAC
AIRSPEED
(FOOTS)

TR18
SPEED
(MPH)

AVG
GAT
(DEG C)

AVG
ALTITUDE
(FEET)

AVG
LAT
(N)

AVG
LONG
(W)

AVG
ALTITUDE
(FEET)

AVG
LAT
(N)

AVG
LONG
(W)

AVG
ALTITUDE
(FEET)

AVG
LAT
(N)

AVG
LONG
(W)

AVG
ALTITUDE
(FEET)

AVG
LAT
(N)

AVG
LONG
(W)

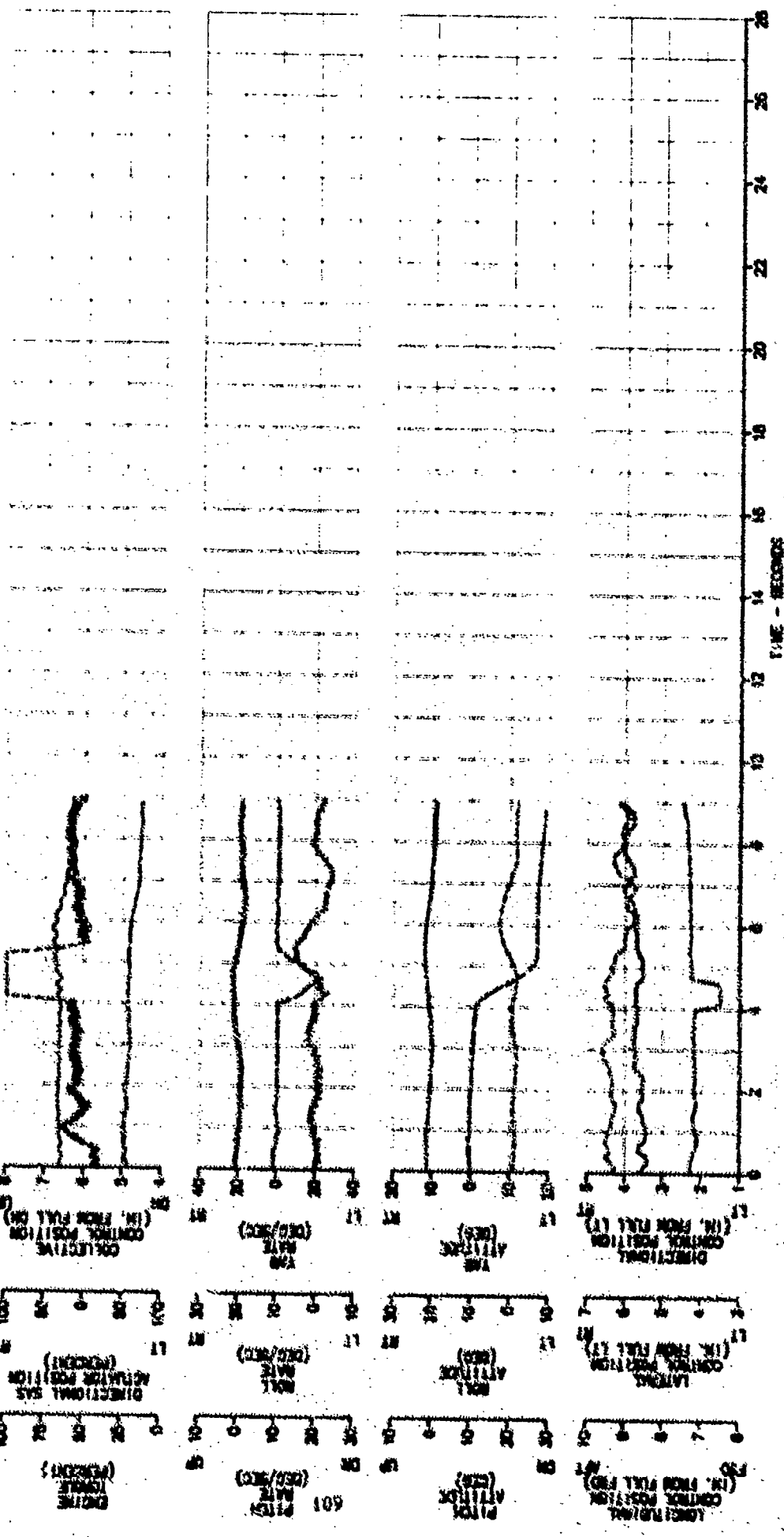


FIGURE E-74
LEFT DIRECTIONAL PULSE INPUT - 180 DEGREE AZIMUTH

JOM-50C USA S/N 70-15349

AVG CROSS WEIGHT (LB)	AVG CS LONG (FS)	AVG CS LAT (BL)	AVG DENSITY ALTITUDE (FEET)	AVG OAT (DEG C)	TRIM ROTOR SPEED (RPM)	TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
2870	108.6	-0.1 LT	3750	23.0	354	20	OFF

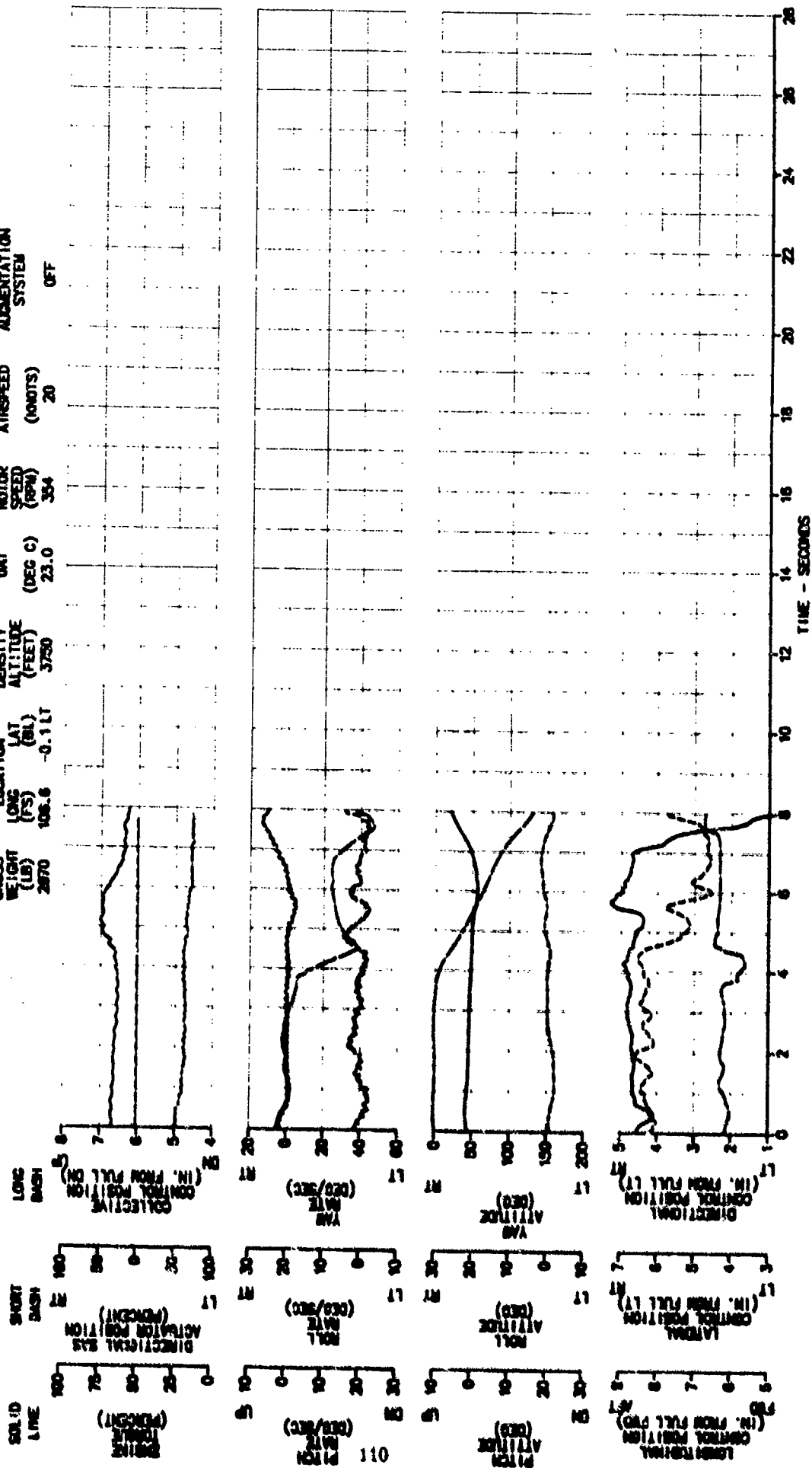


FIGURE E-75
RIGHT DIRECTIONAL PULSE INPUT - 180 DEGREE AZIMUTH
JCH-58C USA S/N 70-15349

AVG GROSS WEIGHT (LB) 2800
 AVG CG LONG (IN) 108.6
 AVG CG LAT (IN) 0.117
 AVG DENSITY ALTITUDE (FEET) 3040
 AVG QAT (DEG C) 25.0
 TRIM ROTOR SPEED (RPM) 354
 TRUE AIRSPEED (KNOTS) 20
 STABILITY AUGMENTATION SYSTEM ON

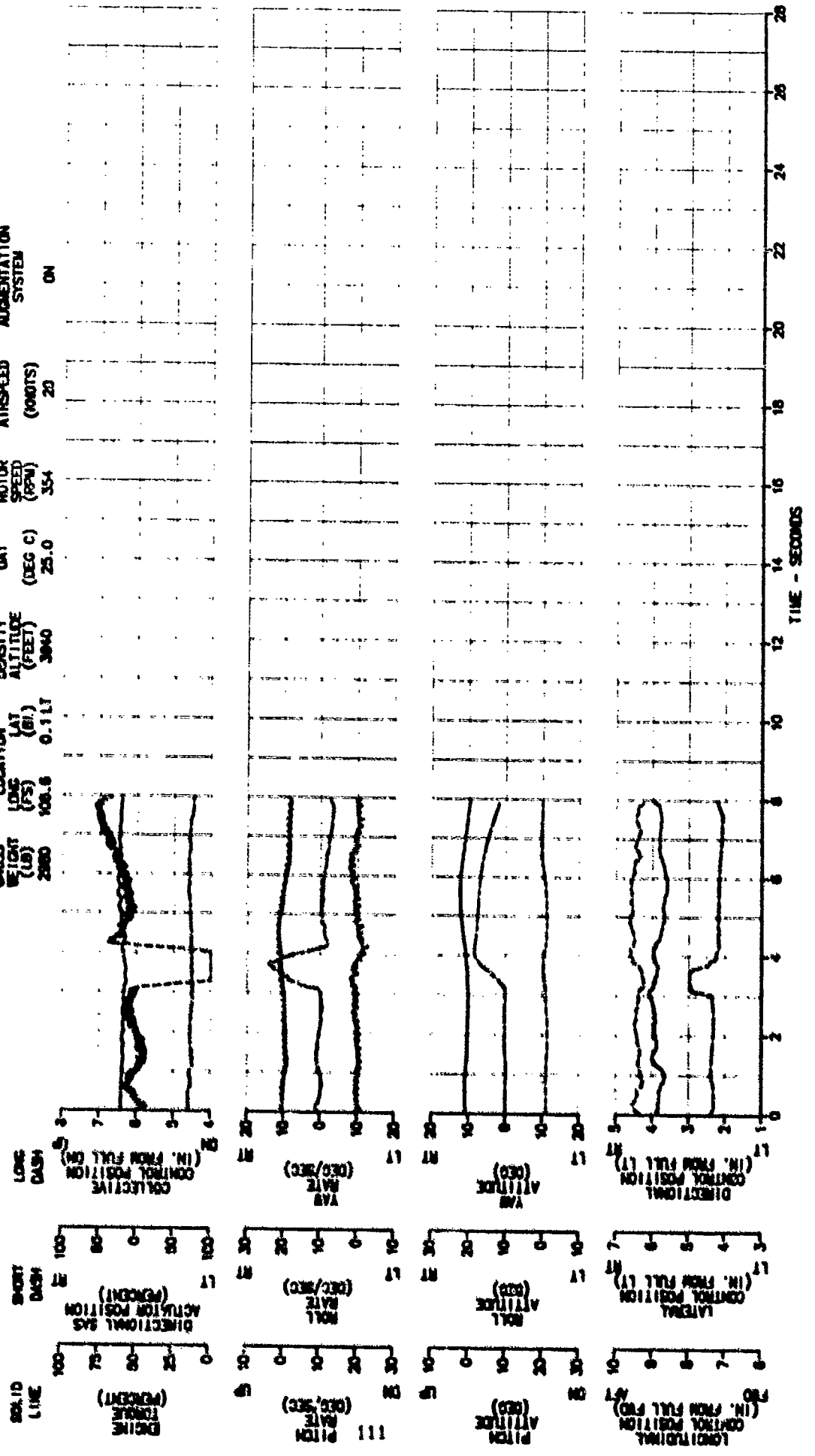
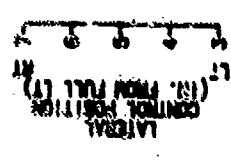
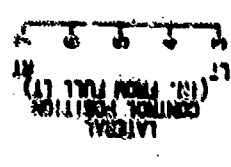
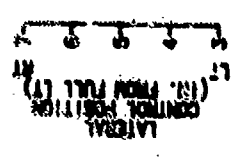
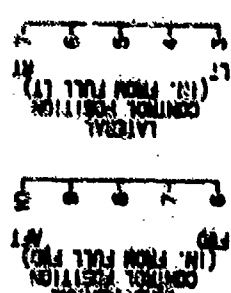
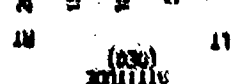
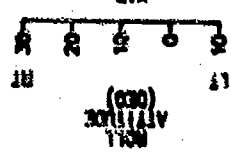
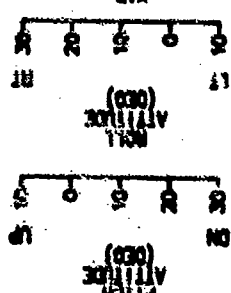
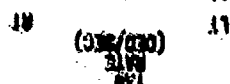
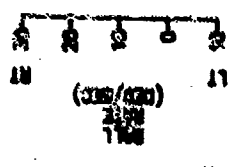
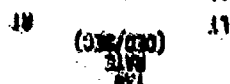
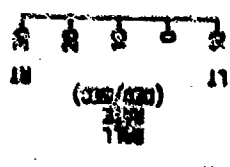
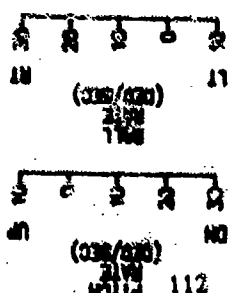
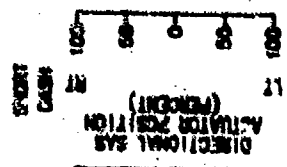
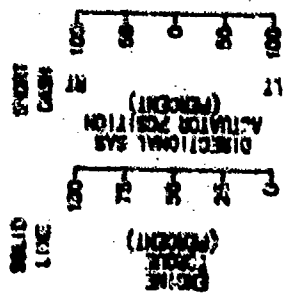


FIGURE E-76
RIGHT DIRECTIONAL PULSE INPUT - 180 DEGREE AZIMUTH

JOH-50C USA S/N 70-15348

AVG CROSS WEIGHT (LB)	2870	AVG CG LONG (F)	108.6	AVG CG LAT (BL)	0.1 LT	AVG DENSITY ALTITUDE (FEET)	3670	AVG OAT (DEG C)	22.5	TRIM MOTOR SPEED (RPM)	353	TIME AIRSPEED (KNOTS)	20	STABILITY AUGMENTATION SYSTEM	OFF
-----------------------	------	-----------------	-------	-----------------	--------	-----------------------------	------	-----------------	------	------------------------	-----	-----------------------	----	-------------------------------	-----



TIME - SECONDS

FIGURE E-77
LEFT DIRECTIONAL PULSE INPUT - 180 DEGREE AZIMUTH

JOH-58C USA S/N 7L 15349
TRLE AIRSPEED (KNOTS) 30
STABILITY AUGMENTATION SYSTEM ON
TRIN ROTOR SPEED (RPM) 356
AVG GAT (EG C) 21.5
AVG DENSITY ALTITUDE (FEET) 3550
AVG CG LAT (BL) 0.117
AVG LONG (PS) 108.5
AVG CROSS WEIGHT (LB) 2580

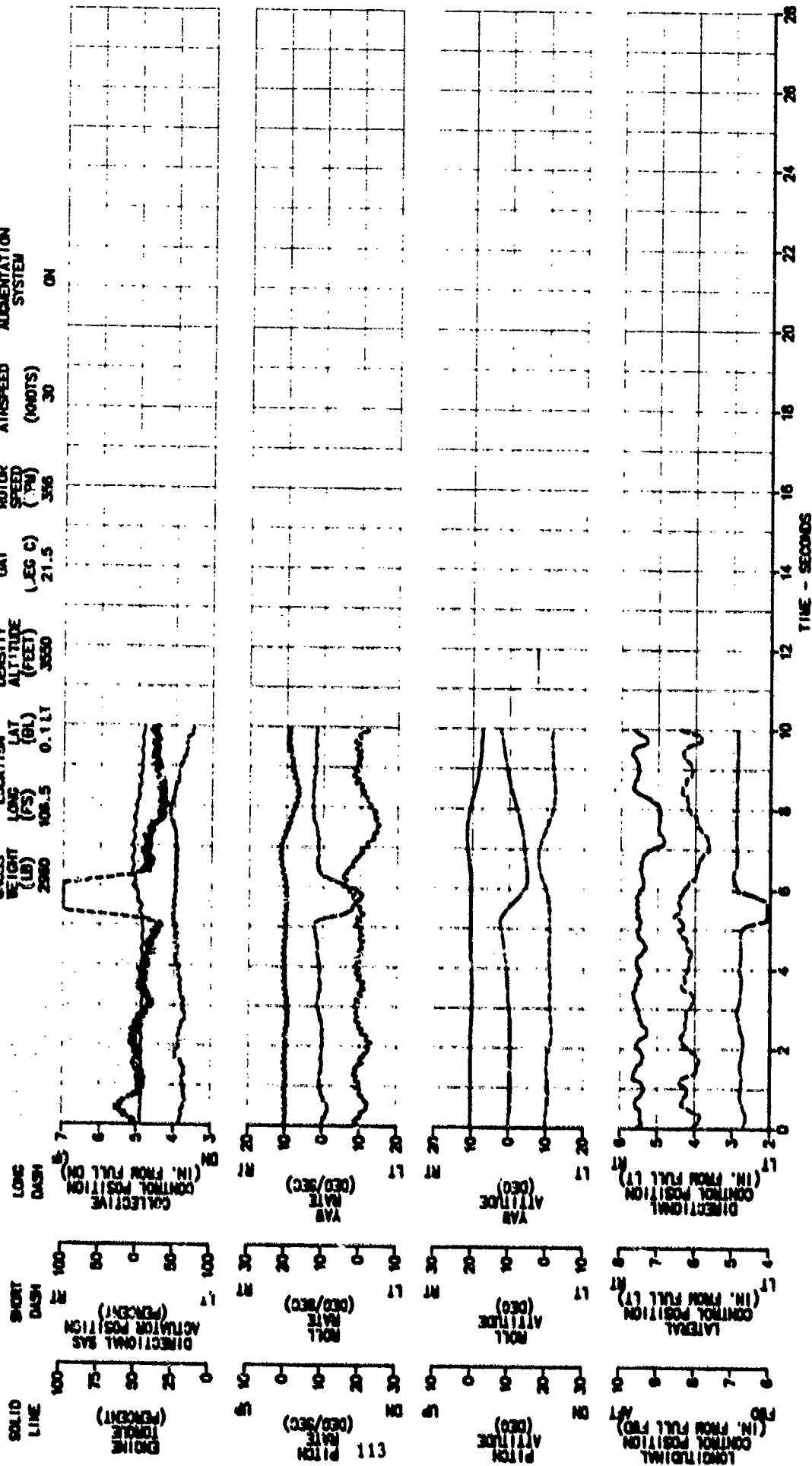


FIGURE E-78
LEFT DIRECTIONAL PULSE INPUT - 180 DEGREE AZIMUTH

JOH-SEC USA S/N 70-15346
AVG GROSS WEIGHT (LB) 2800
AVG CG LOCATION LONG 108.1 LAT 0.1 LT
AVG DENSITY ALTITUDE (FEET) 3700
AVG OAT (DEG C) 22.5
TRIM MOTOR SPEED (RPM) 354
TRUE AIRSPEED (KNOTS) 30
STABILITY AUGMENTATION SYSTEM OFF

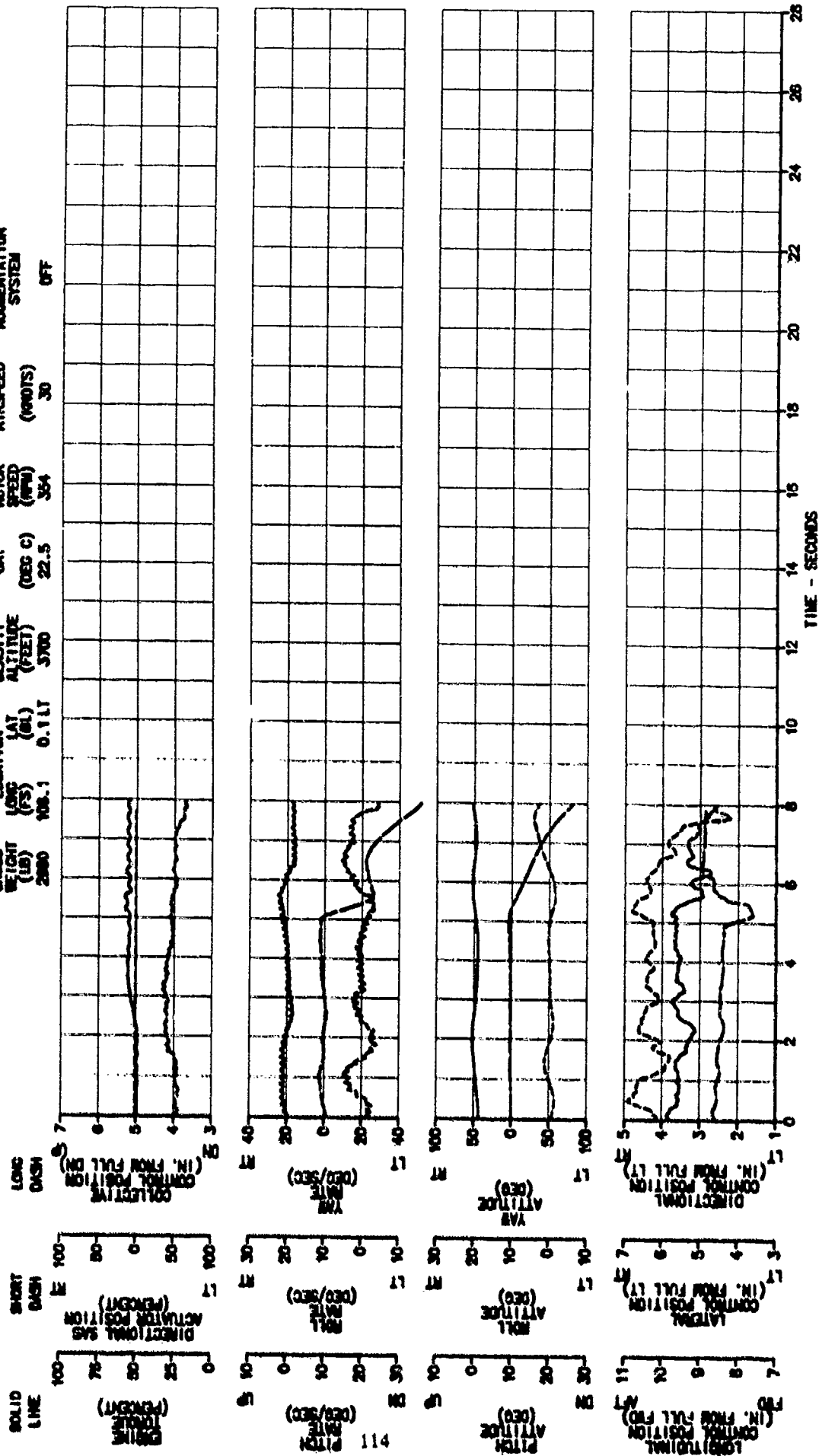


FIGURE E-79

RIGHT DIRECTIONAL PULSE INPUT - 180 DEGREE AZIMUTH

JCH-500 USA S/N 70-15349

AVG GROSS WEIGHT (LB) 2860
 AVG CG LONG (FS) 108.5
 AVG CG LAT (BL) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 3560
 AVG OAT (DEG C) 21.5
 TRUE AIRSPEED (KNOTS) 30
 ROTOR SPEED (RPM) 354
 STABILITY AUGMENTATION SYSTEM ON

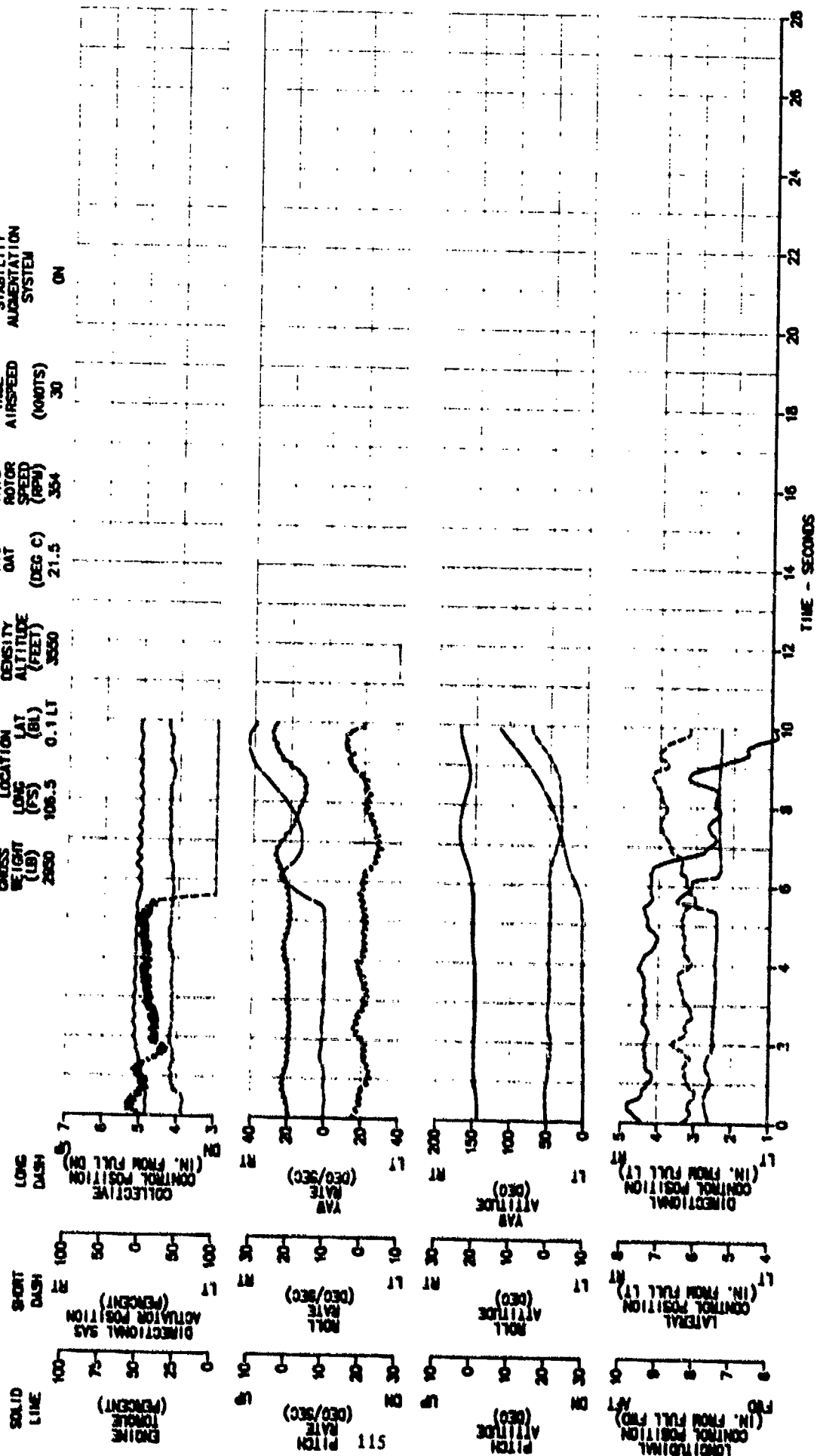


FIGURE E-80
RIGHT DIRECTIONAL PULSE INPUT - 180 DEGREE AZIMUTH

JOH-58C USA S/N 70-15348
 AVG WEIGHT (LB) 2000
 AVG CG LONG (FS) 106.1 LAT (BL) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 3020
 AVG OAT (DEG C) 22.0
 TRIM MOTOR SPEED (RPM) 355
 TRUE AIRSPEED (KNOTS) 30
 STABILITY AUGMENTATION SYSTEM OFF

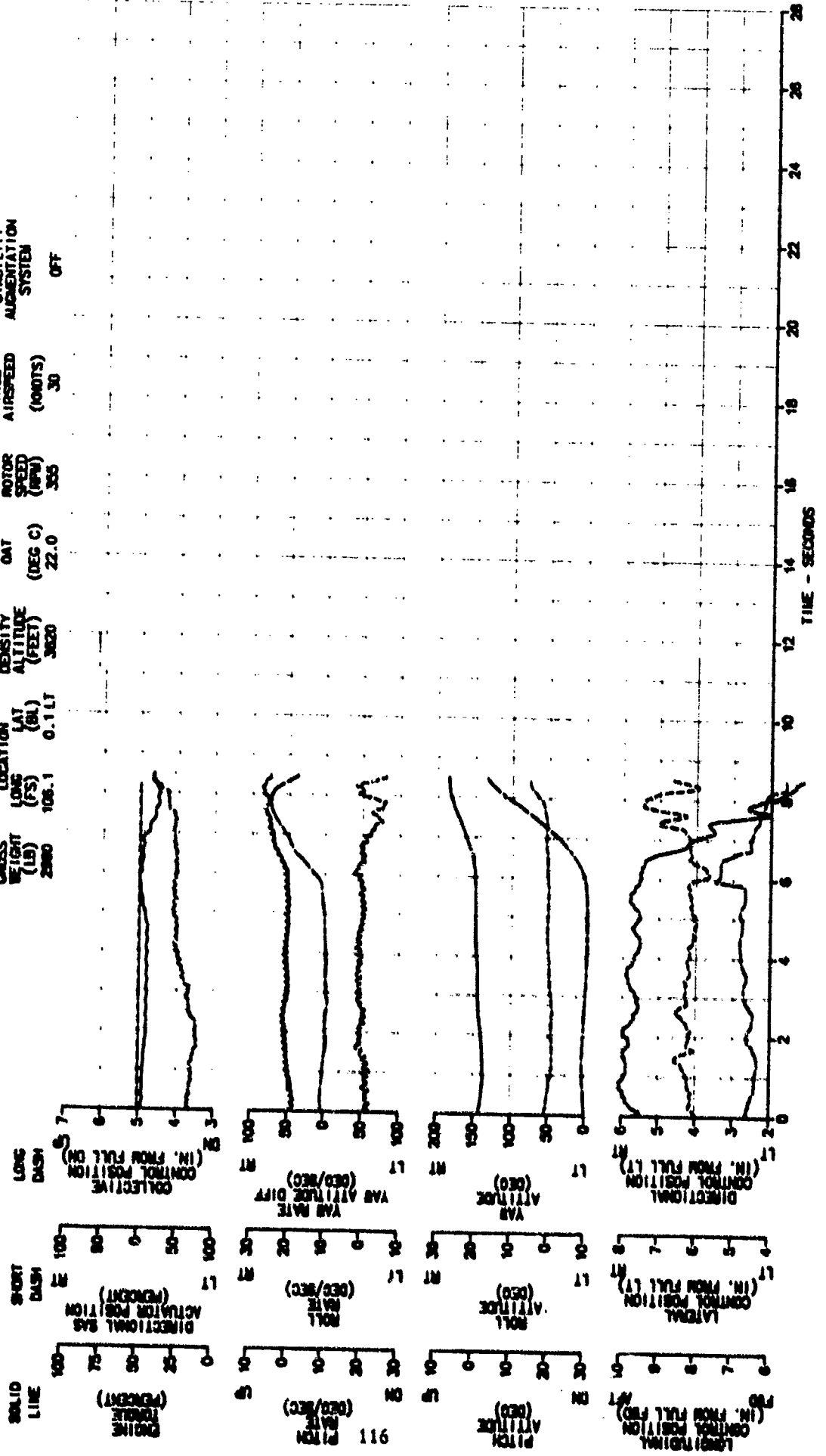


FIGURE E-81
LEFT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JOM-58C USA S/N 70-15348

AVG CROSS WEIGHT (LB)	2870	AVG CG LOCATION	LONG (FS)	LAT (ML)	AVG DENSITY (DEG C)	AVG GAT (DEG C)	TRIM MOTOR SPEED (RPM)	TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
			107.5	0.117	4270	27.5	353	0	ON

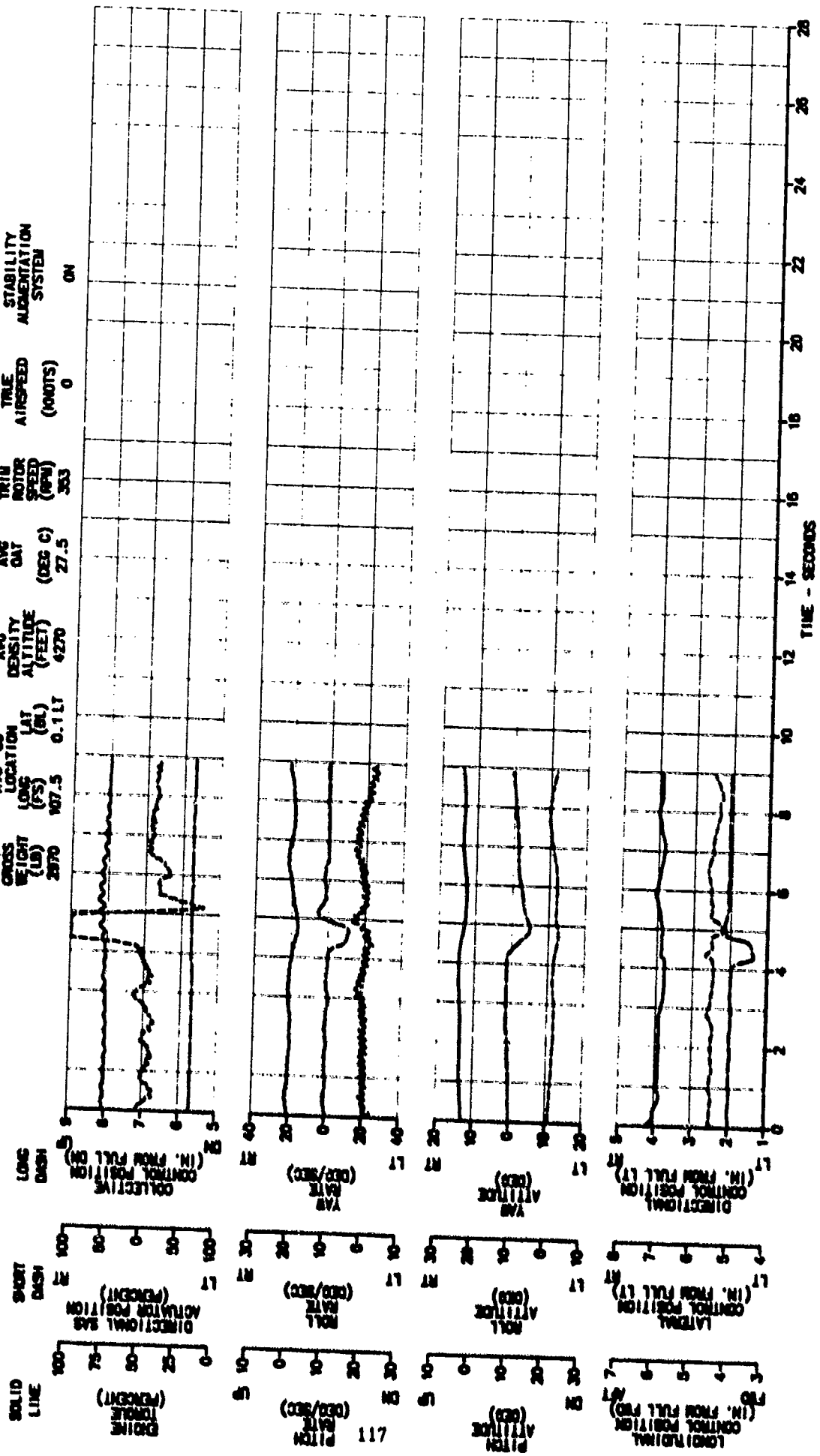


FIGURE E-82
LEFT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JOH-SEC UBA S/N 70-15348

AVG CROSS WEIGHT (LB) 2000
 AVG CG LOCATION LONG (PS) 107.5 LAT (ML) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 4300
 AVG CAT (DEG C) 28.0
 TRIM MOTOR SPEED (RPM) 303
 TRUE AIRSPEED (KNOTS) 0
 STABILITY AUGMENTATION SYSTEM OFF

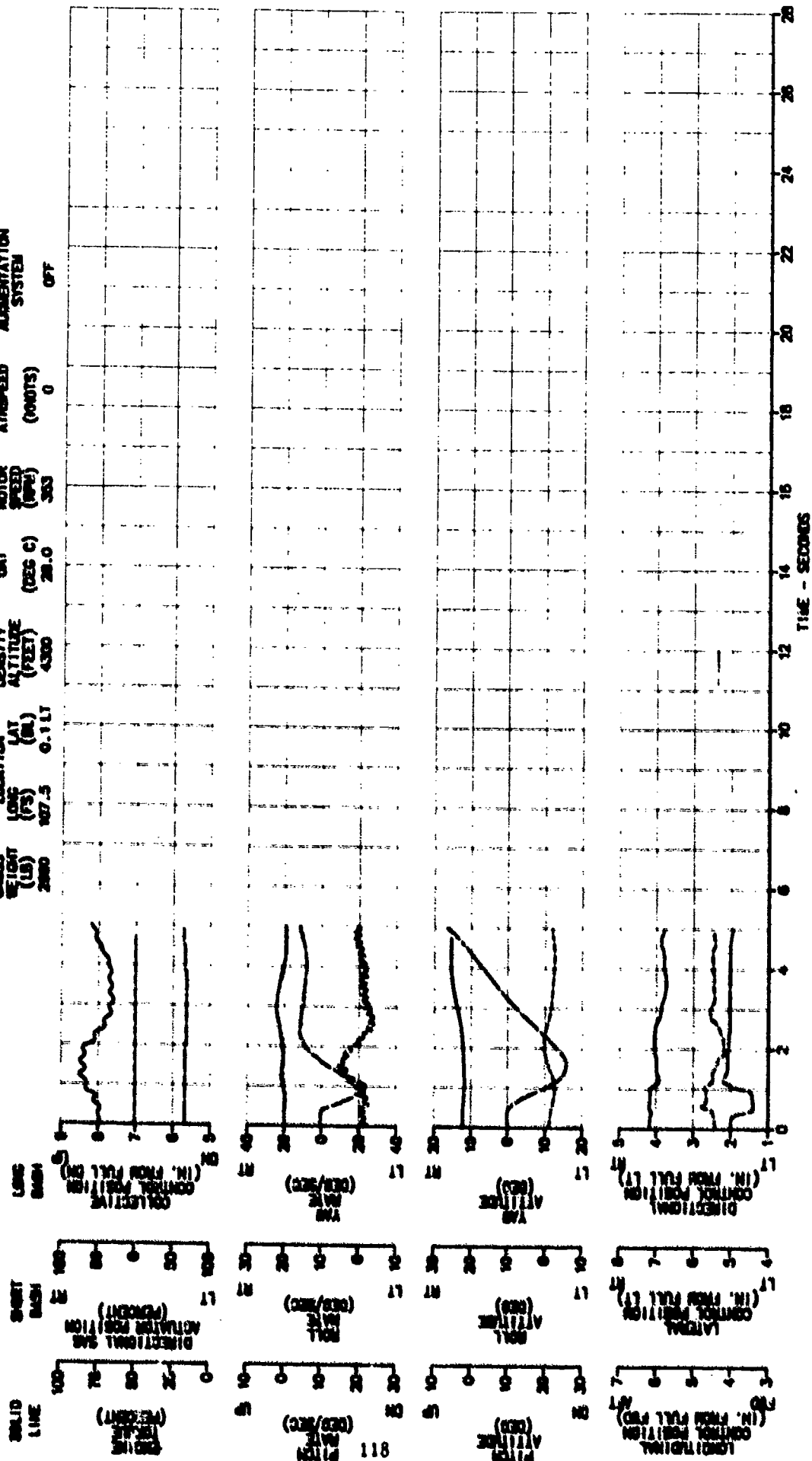


FIGURE E-83

RIGHT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JOH-58C USA S/N 70-15349

AVG CROSS WEIGHT (LB)	2860	AVG CB LONG (FT)	107.5	AVG CB LAT (BL)	0.1 LT	AVG DENSITY ALTITUDE (FEET)	4280	AVG QAT (DEG C)	27.5	MOTOR SPEED (RPM)	303	TRUE AIRSPEED (KNOTS)	0	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	------------------	-------	-----------------	--------	-----------------------------	------	-----------------	------	-------------------	-----	-----------------------	---	-------------------------------	----

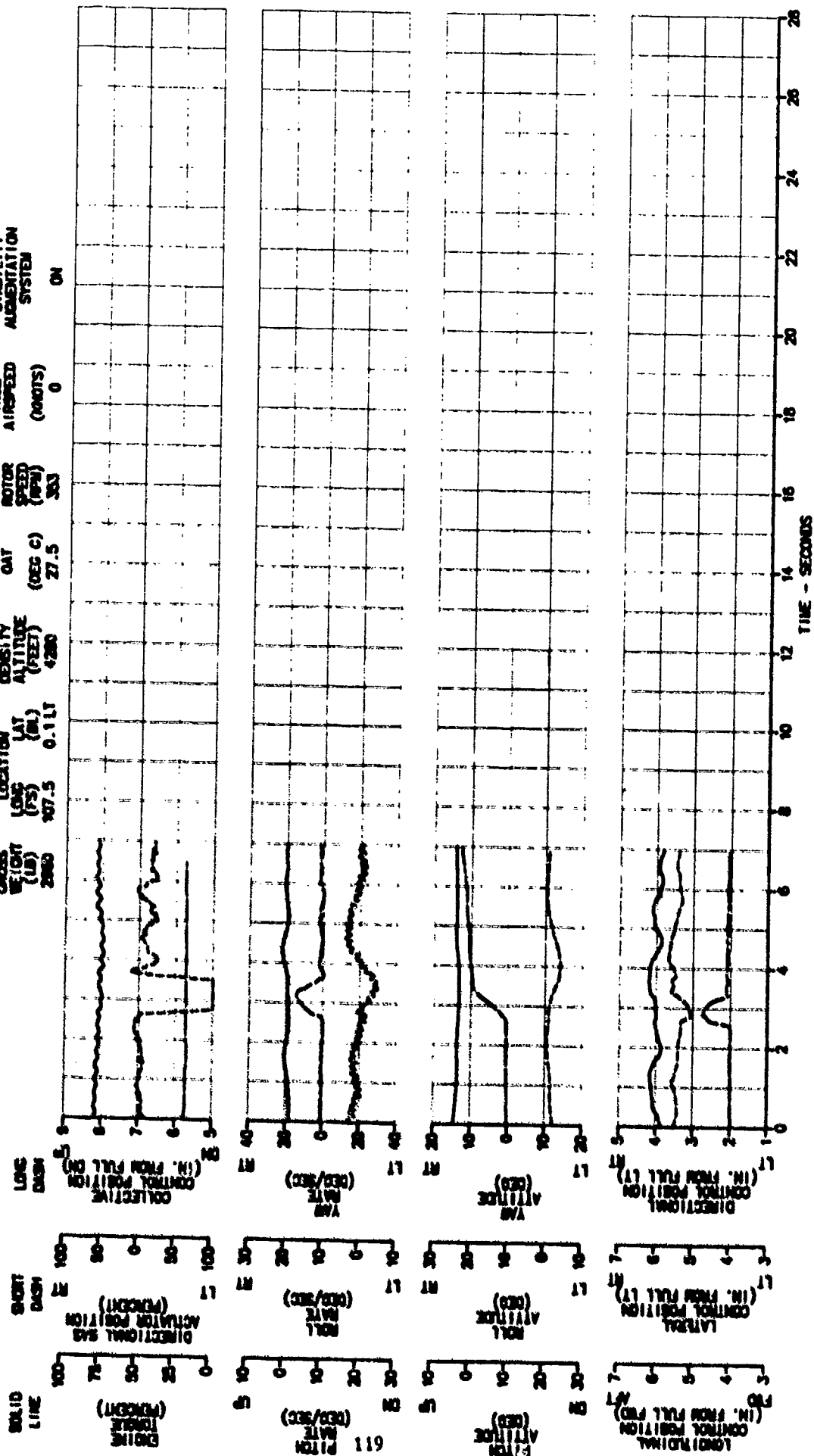


FIGURE E-84
RIGHT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JOM-80C USA S/N 70-15348

AVG GROSS WEIGHT (LB)	2880	AVG CS LONG (FS)	107.5	AVG CS LAT (ML)	0.117	AVG DENSITY ALTITUDE (FEET)	4280	AVG OAT (DEG C)	28.0	TRIM MOTOR SPEED (RPM)	302	TRUE AIRSPEED (KNOTS)	0	STABILITY AUGMENTATION SYSTEM	OFF
-----------------------	------	------------------	-------	-----------------	-------	-----------------------------	------	-----------------	------	------------------------	-----	-----------------------	---	-------------------------------	-----

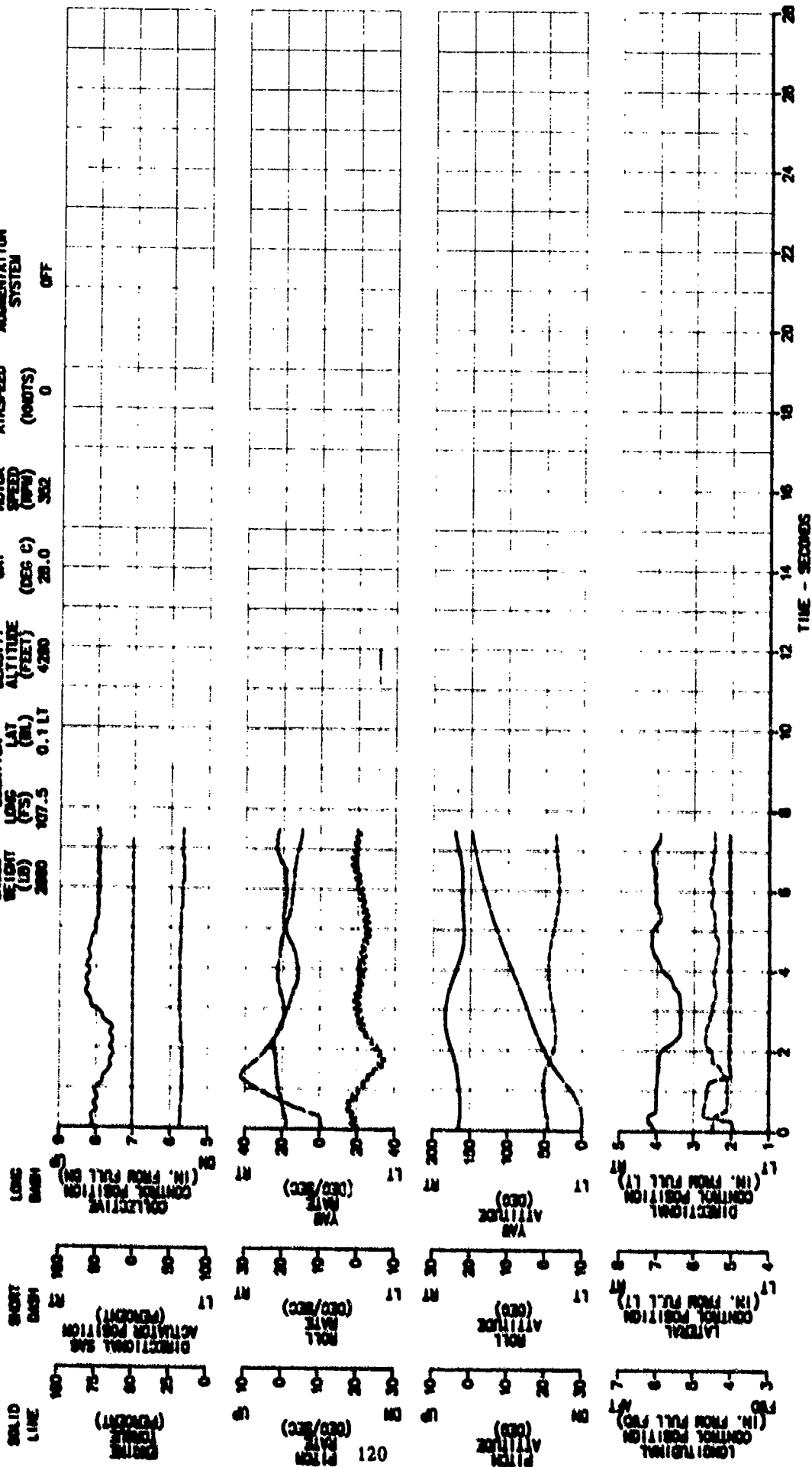


FIGURE E-85
LEFT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JOH-CSC USA S/N 70-15349

AVG CROSS WEIGHT (LB)	2880	AVG CG LOCATION LONG (FS)	107.5	AVG CG LAT (BL)	0.117	AVG DENSITY (DEG C)	28.5	TRIM MOTOR SPEED (RPM)	353	TRUE AIRSPEED (KNOTS)	10	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	---------------------------	-------	-----------------	-------	---------------------	------	------------------------	-----	-----------------------	----	-------------------------------	----

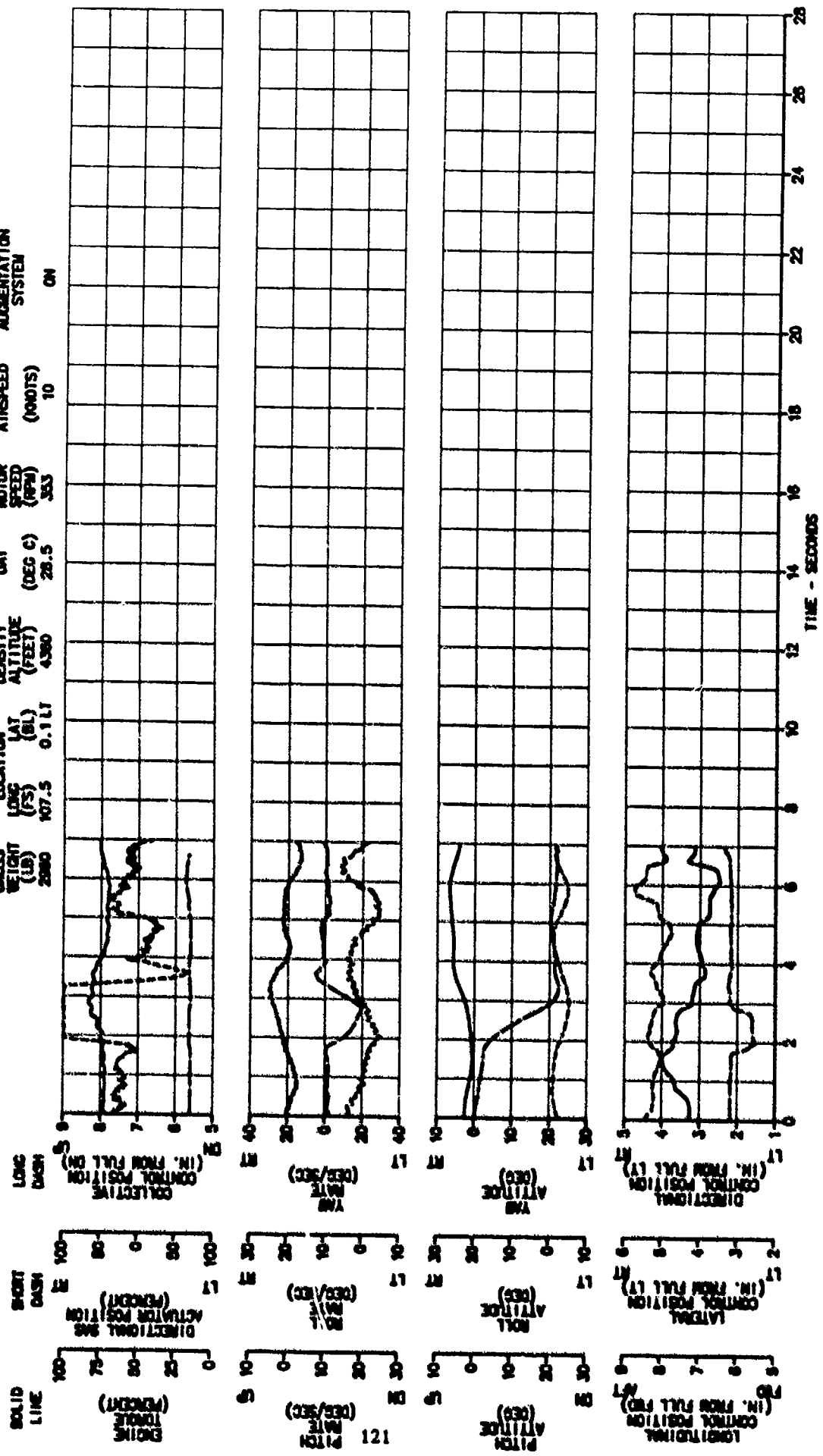


FIGURE E-96
LEFT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

J04-082 UEA S/N 70-15348

AVG CDRG WEIGHT (LB)	2000	AVG CS LONG (FS)	107.5	AVG CS LAT (DL)	0.117	AVG DENSITY (DEG C)	28.0	TRIM MOTOR SPEED (RPM)	303	TRIM AIRSPEED (KNOTS)	10	STABILITY AUGMENTATION SYSTEM	OFF
----------------------	------	------------------	-------	-----------------	-------	---------------------	------	------------------------	-----	-----------------------	----	-------------------------------	-----

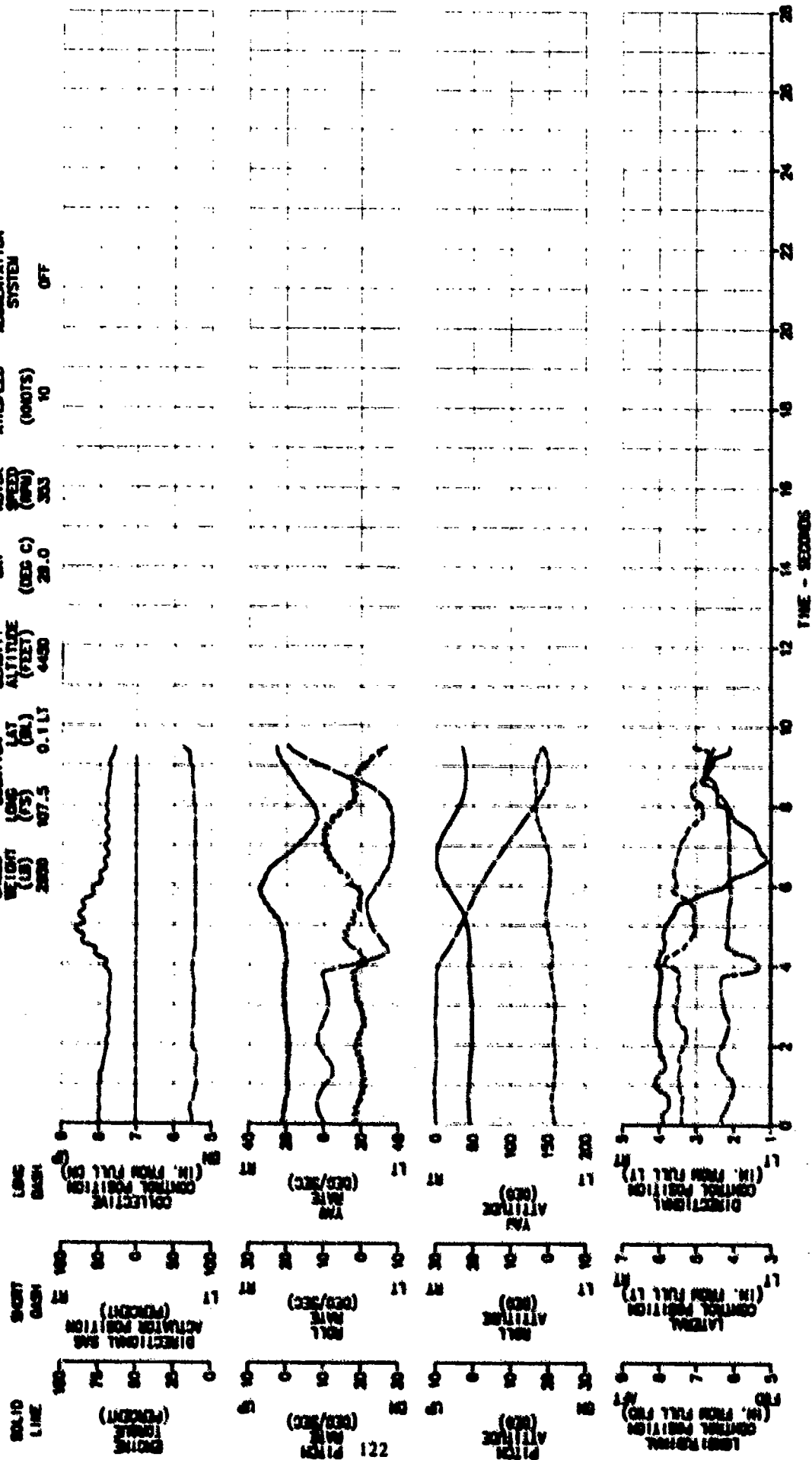


FIGURE C-37

RIGHT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JOH-200 UBA S/N 70-15349

TABLE
AIRSPEED
(KNOTS)
10
ON

TRIM
SPEED
(KNOTS)
306
28.5

AVG CH
LOCATION
LONG
(°E)
107.5
LAT
(°N)
0.11

AVG CH
WEIGHT
(LB)
2000

AVG CH
DENSITY
ALTITUDE
(FEET)
4300

AVG CH
STABILITY
AUGMENTATION
SYSTEM
ON

AVG CH
LONG
(°E)
107.5
LAT
(°N)
0.11

AVG CH
WEIGHT
(LB)
2000

AVG CH
DENSITY
ALTITUDE
(FEET)
4300

AVG CH
STABILITY
AUGMENTATION
SYSTEM
ON

AVG CH
LONG
(°E)
107.5
LAT
(°N)
0.11

AVG CH
WEIGHT
(LB)
2000

AVG CH
DENSITY
ALTITUDE
(FEET)
4300

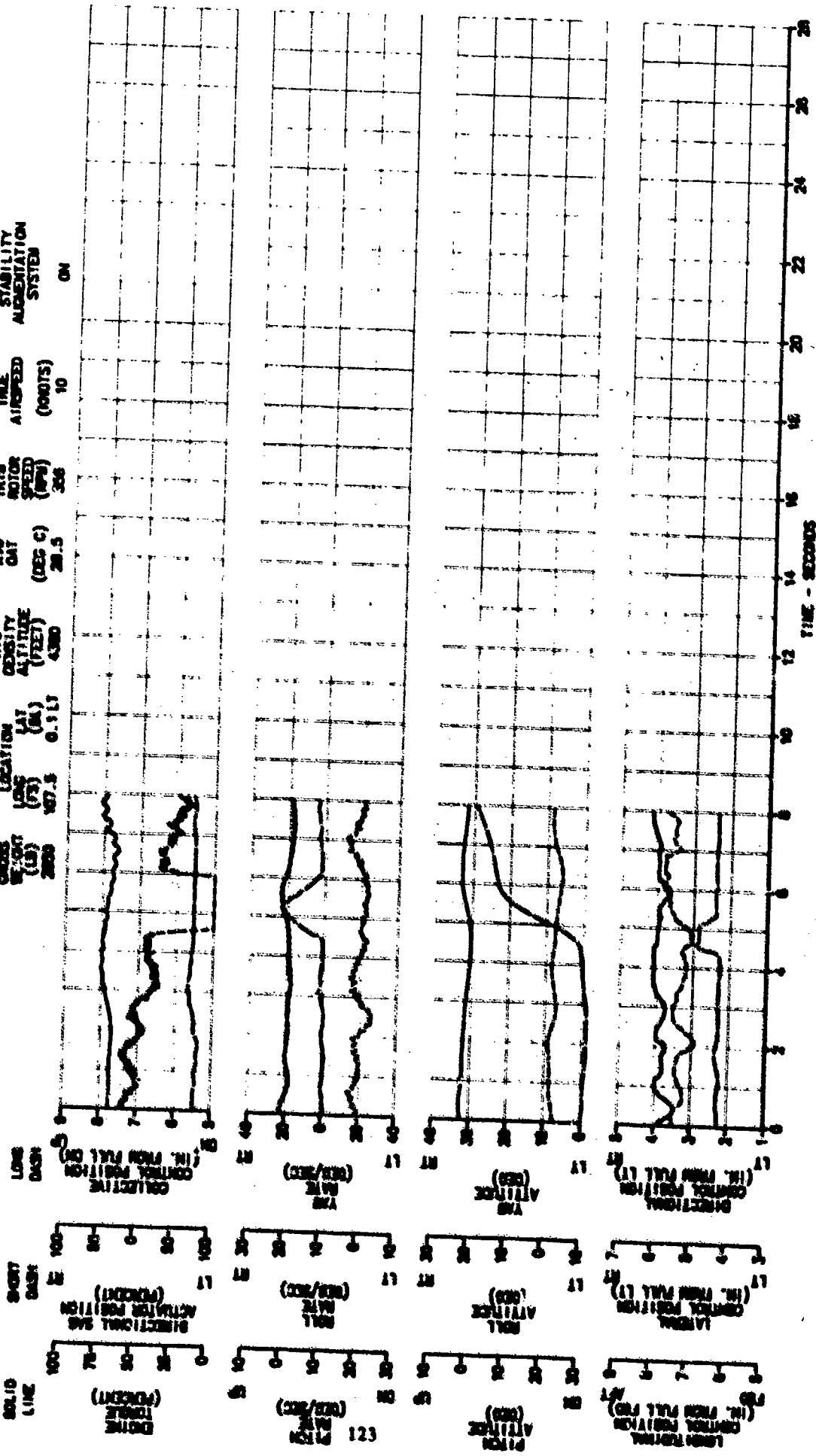


FIGURE E-88
RIGHT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JM-58C USA S/N 70-15349
 TRIM ROTOR SPEED 352
 AIRSPEED (KNOTS) 10
 STABILITY AUGMENTATION SYSTEM OFF
 AVG GROSS WEIGHT (LB) 2850
 AVG CS LOCATION LAT (BL) 0.1 LT
 LONG (FS) 107.5
 DENSITY ALT (FEET) 4500
 AVG OAT (DEG C) 28.5

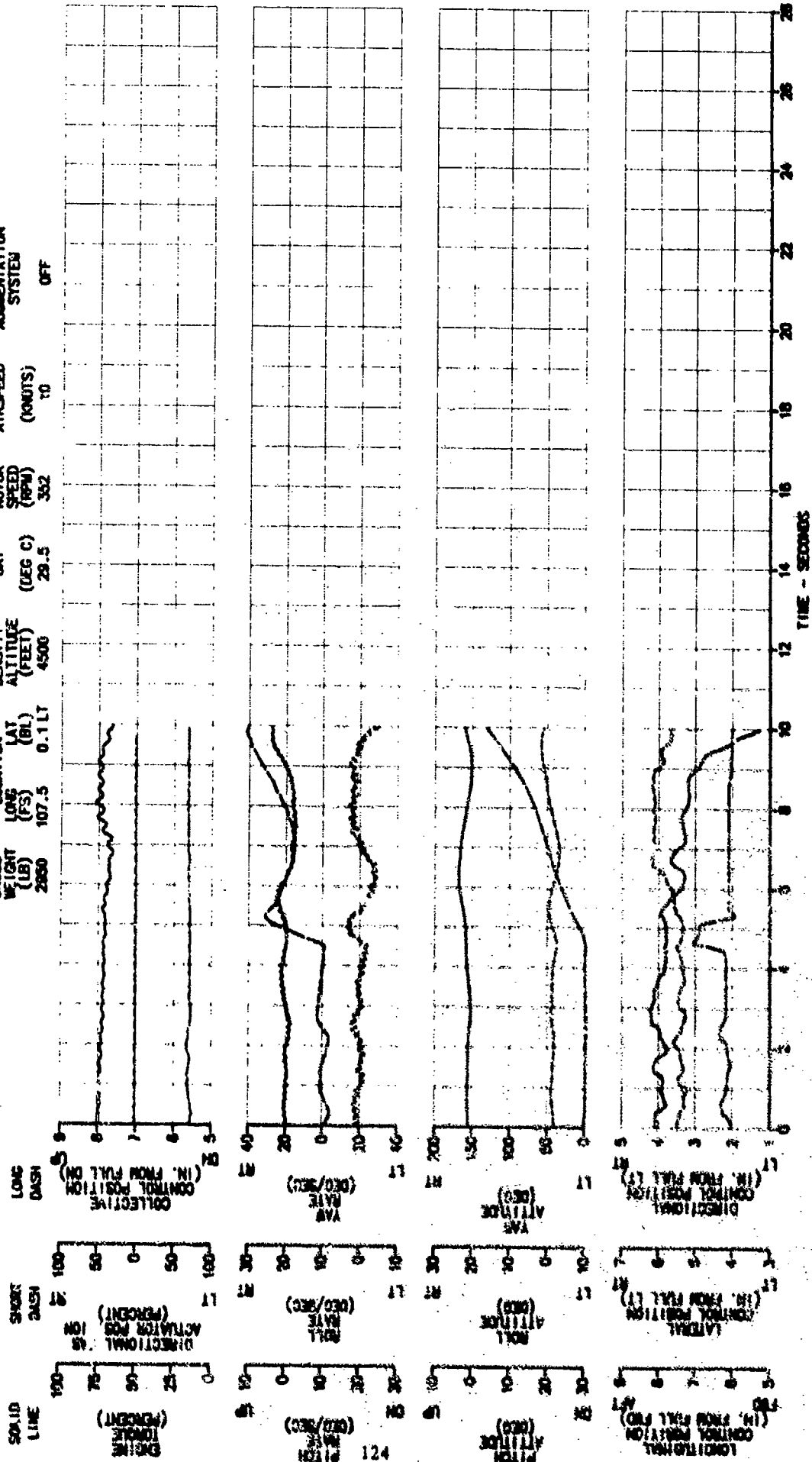


FIGURE 5-89
LEFT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JOH-58C USA S/N 70-15349
 STABILITY AUGMENTATION SYSTEM ON
 TIME AIRSPEED (KNOTS) 20
 TRIM ROTOR SPEED (RPM) 354
 AVG DENSITY ALT (DEG C) 28.5
 AVG ALTITUDE (FEET) 4480
 LAT (ML) 0.5 LT
 LONG (FS) 107.1
 AVG CROSS WEIGHT (LB) 2880

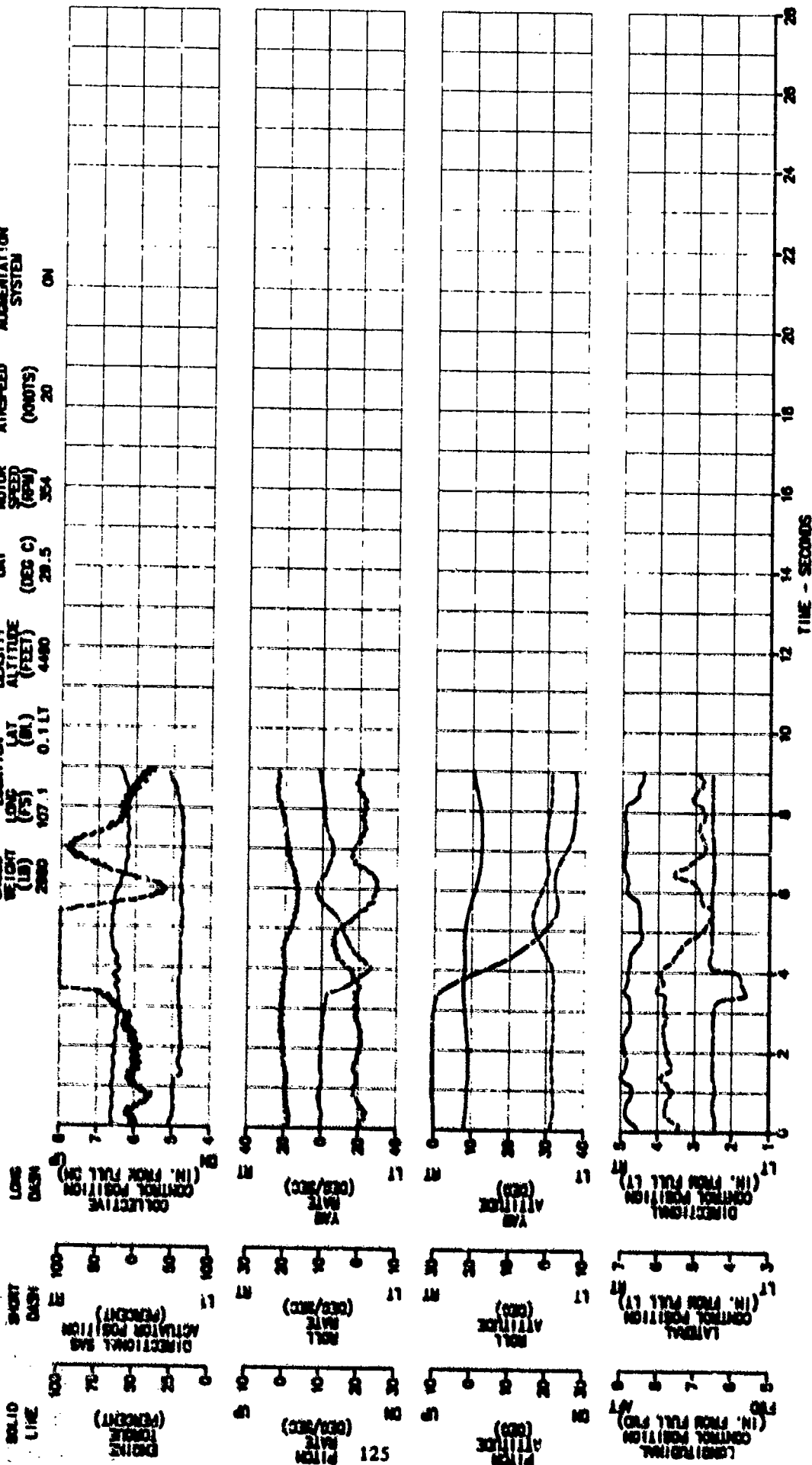


FIGURE E-90
LEFT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JOH-88C USA S/N 70-15349

AVG GROSS WEIGHT (LB)	2800	AVG CG LONG (FS)	107.1	AVG CG LAT (BL)	0.1 LT	AVG DENSITY ALTITUDE (FEET)	4380	AVG QAT (DEG C)	28.5	TRIM Rotor SPEED (RPM)	353	TRUE AIRSPEED (KNOTS)	20	STABILITY AUGMENTATION SYSTEM	OFF
-----------------------	------	------------------	-------	-----------------	--------	-----------------------------	------	-----------------	------	------------------------	-----	-----------------------	----	-------------------------------	-----

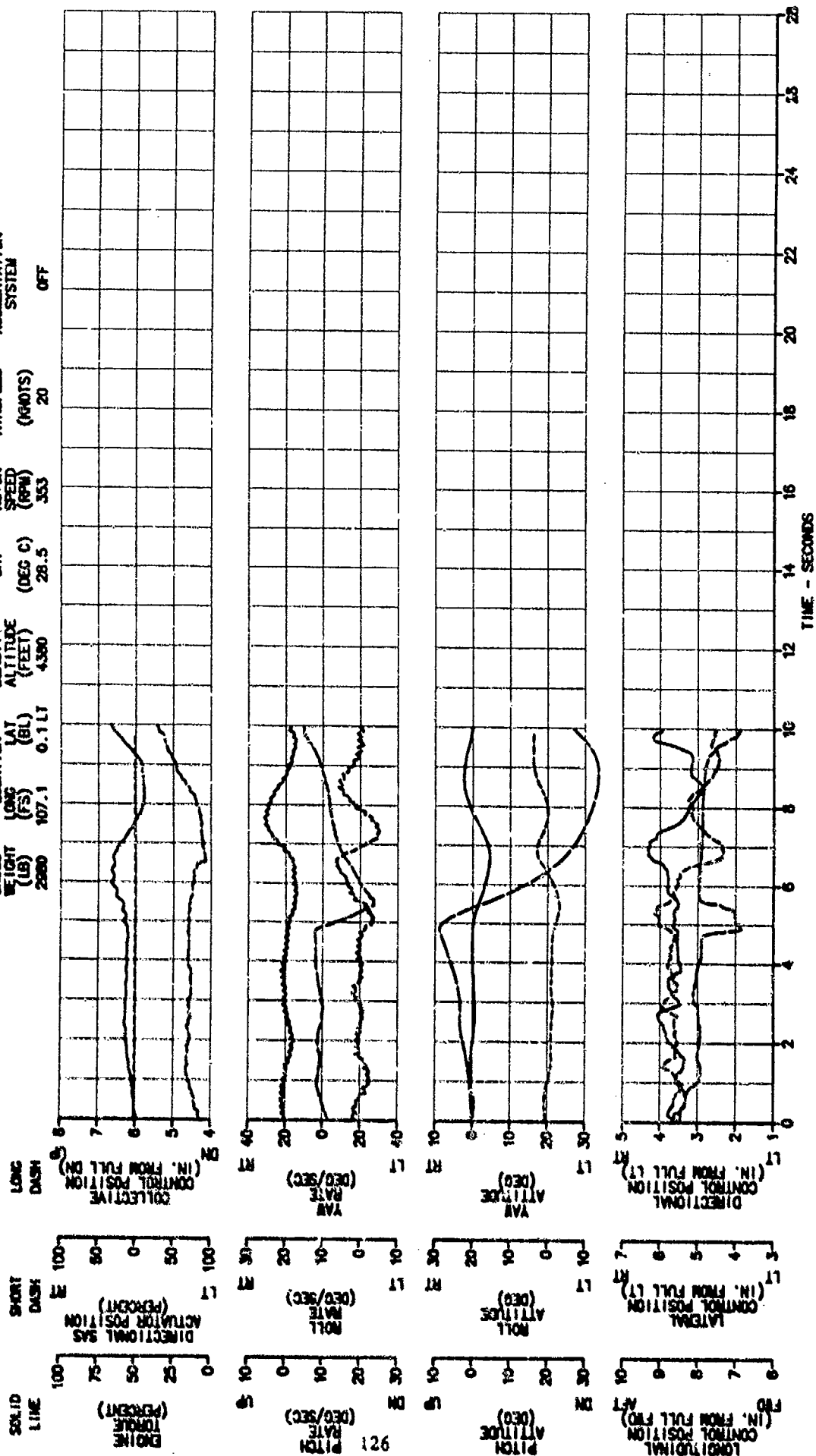


FIGURE E-91
RIGHT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH
JCH-50C USA S/N 70-15349

AVG WEIGHT (LB)	AVG CS LOCATION (FS)	AVG DENSITY ALTITUDE (FEET)	AVG OAT	TRIM RPM	TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
2980	107.1	4460	29.5	352	20	ON

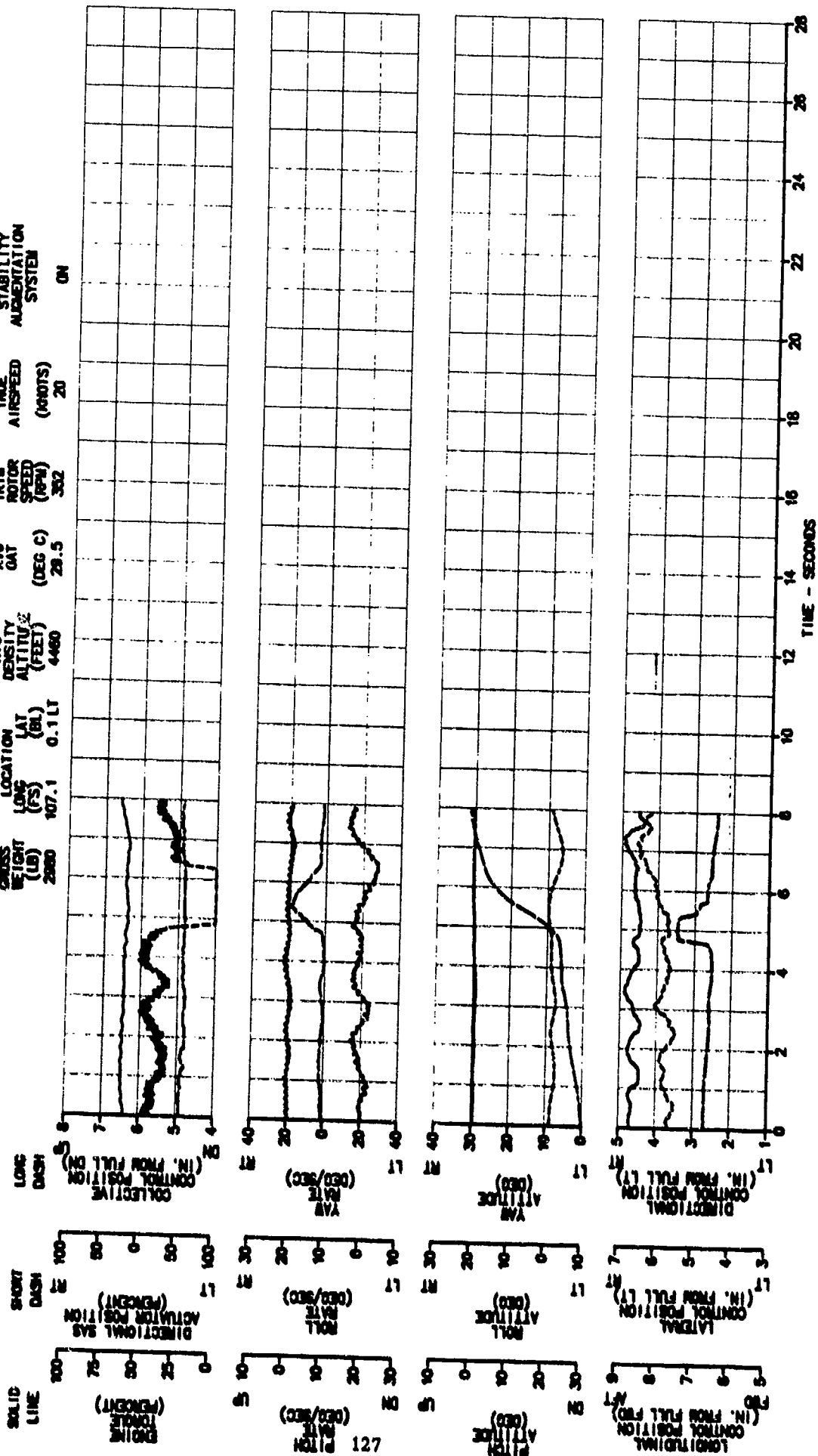


FIGURE E-92
RIGHT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JOH-59C USA S/N 70-15340

AVG GROSS WEIGHT (LB)	2070	AVG CS LONG (FS)	107.0	AVG CS LAT (BL)	0.1 LT	AVG DENSITY ALTITUDE (FEET)	4420	AVG OAT (DEG C)	28.0	TRIM ROTOR SPEED (RPM)	353	TRUE AIRSPEED (KNOTS)	20	STABILITY AUGMENTATION SYSTEM	OFF
-----------------------	------	------------------	-------	-----------------	--------	-----------------------------	------	-----------------	------	------------------------	-----	-----------------------	----	-------------------------------	-----

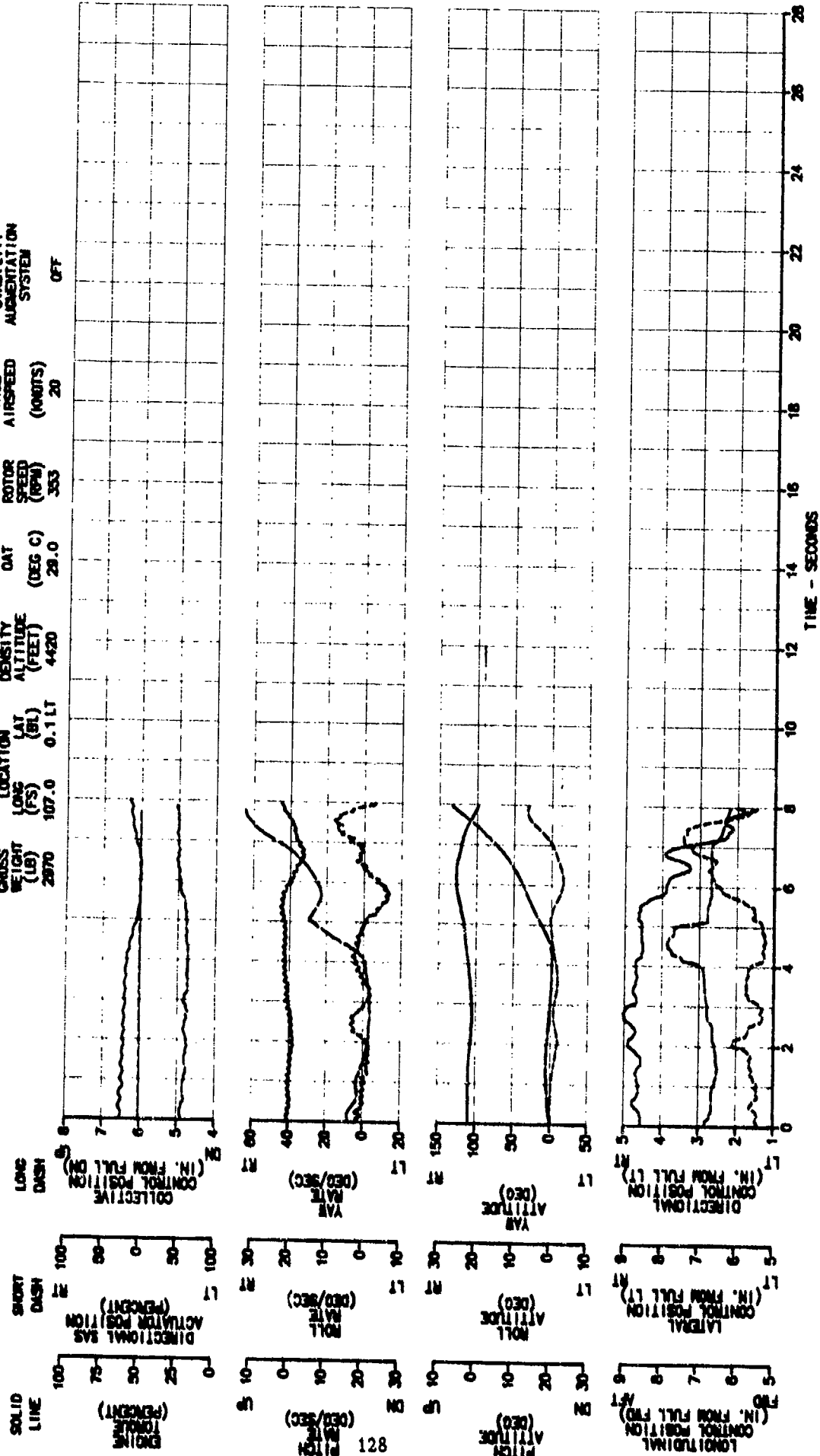


FIGURE E-93
LEFT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JOH-59C USA S/N 70-15348
 AVG CROSS WEIGHT (LB) 2870
 AVG CG LONG (FS) 107.0
 AVG CG LAT (BL) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 4350
 AVG QAT (DEG C) 28.0
 TRIM ROTOR SPEED (RPM) 353
 TRUE AIRSPEED (KNOTS) 30
 STABILITY AUGMENTATION SYSTEM ON

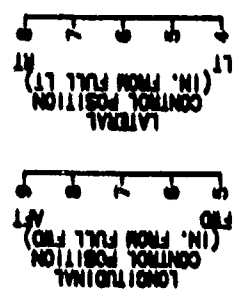
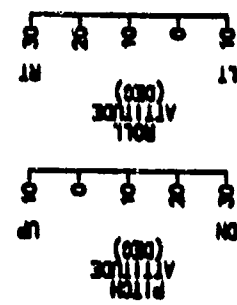
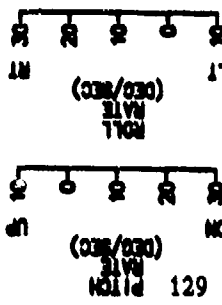
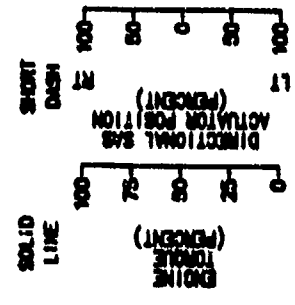
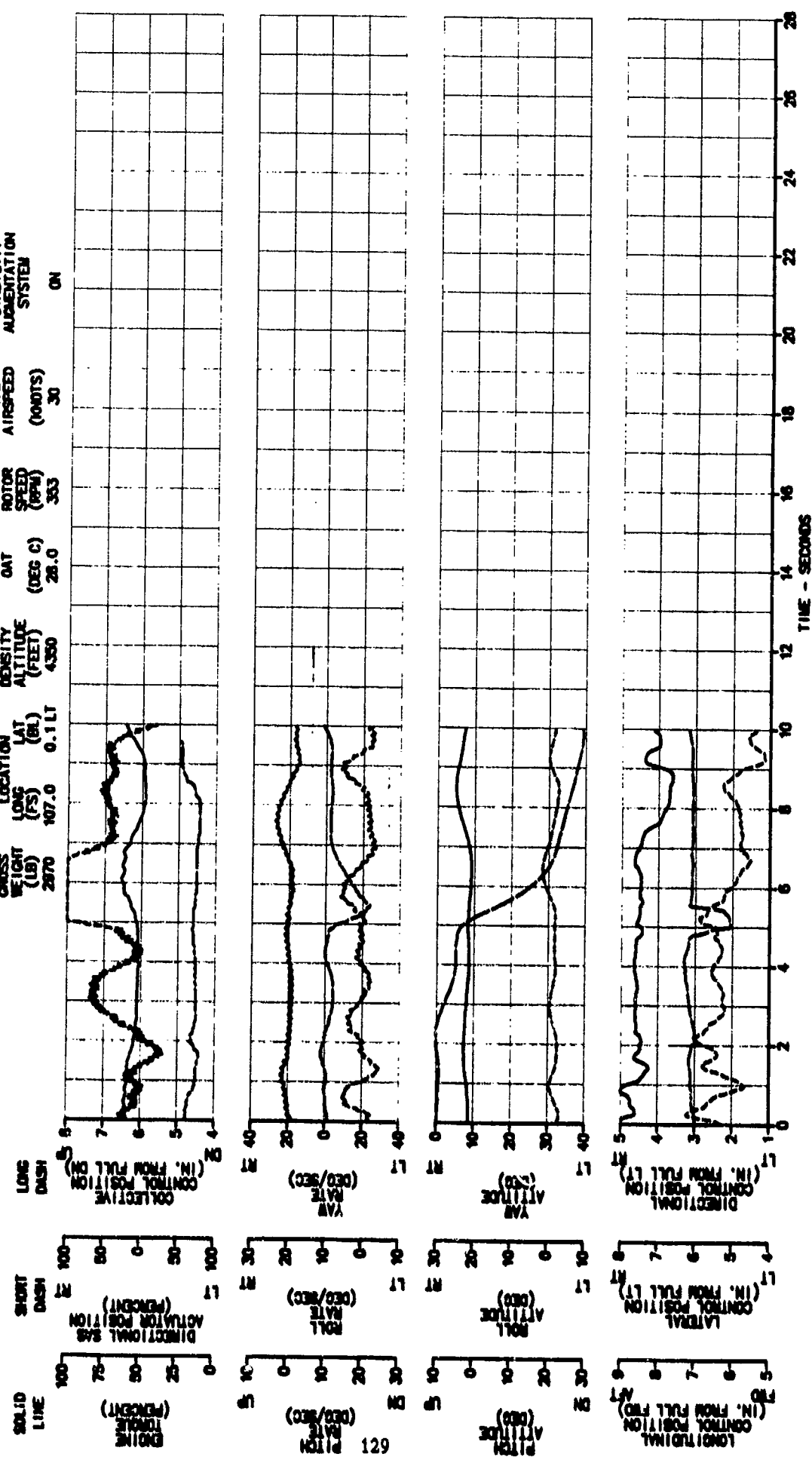


FIGURE E-94
LEFT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JOM-88C USA S/N 70-15349

AVG CROSS WEIGHT (LB)	AVG CS LONG (°S)	AVG CS LAT (BL)	AVG DENSITY ALTITUDE (FEET)	AVG OAT (DEG C)	TRIM ROTOR SPEED (RPM)	TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
2860	107.0	0.1 LT	4340	28.0	364	30	OFF

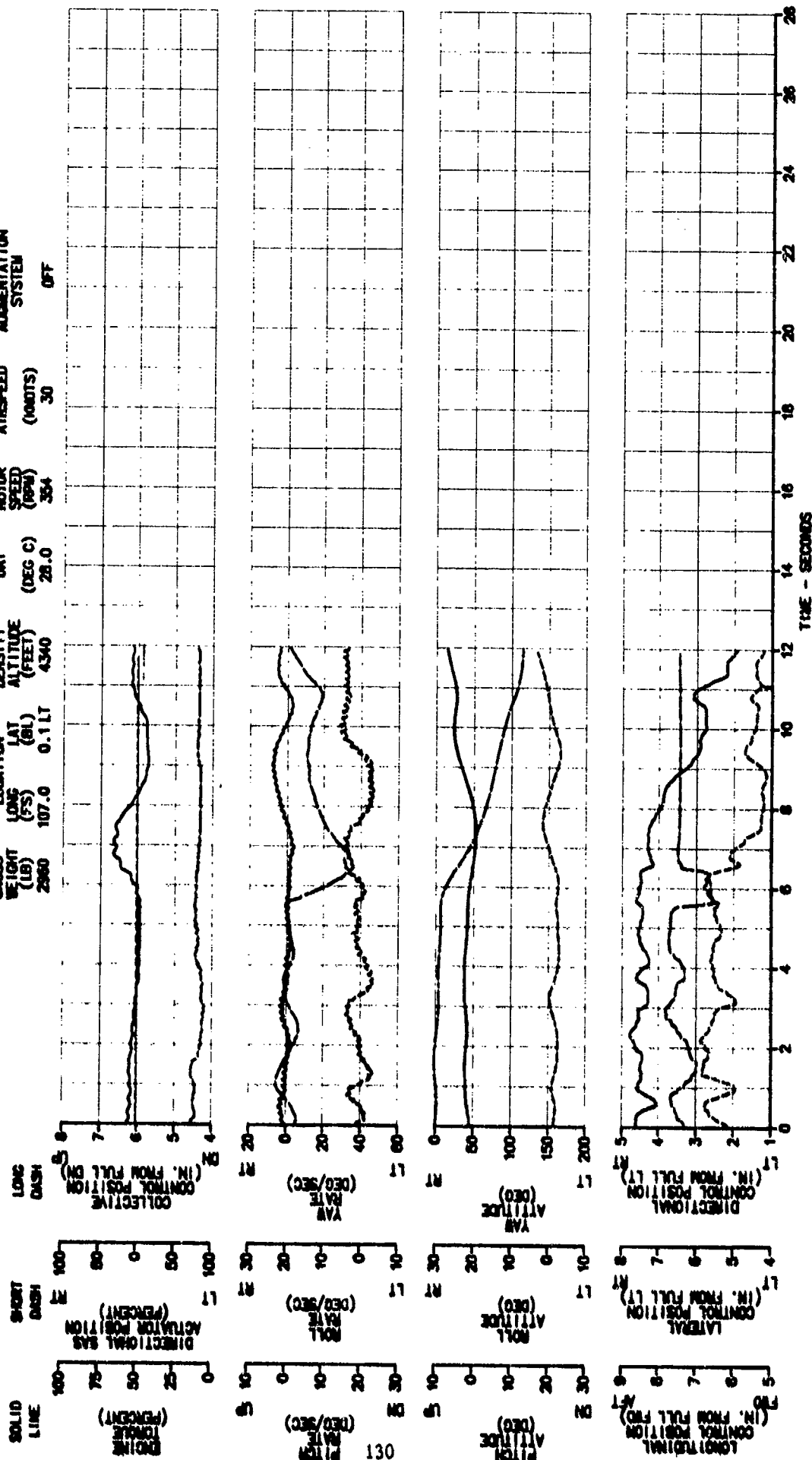


FIGURE E-95

RIGHT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JOH-58C USA S/N 70-15349

AVG GROSS WEIGHT (LB)	2970	AVG CO LONG (FS)	107.0	AVG DENSITY ALTITUDE (FEET)	4280	AVG OAT (DEG C)	28.0	TRIM ROTOR SPEED (RPM)	354	TRUE AIRSPEED (KNOTS)	30	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	------------------	-------	-----------------------------	------	-----------------	------	------------------------	-----	-----------------------	----	-------------------------------	----

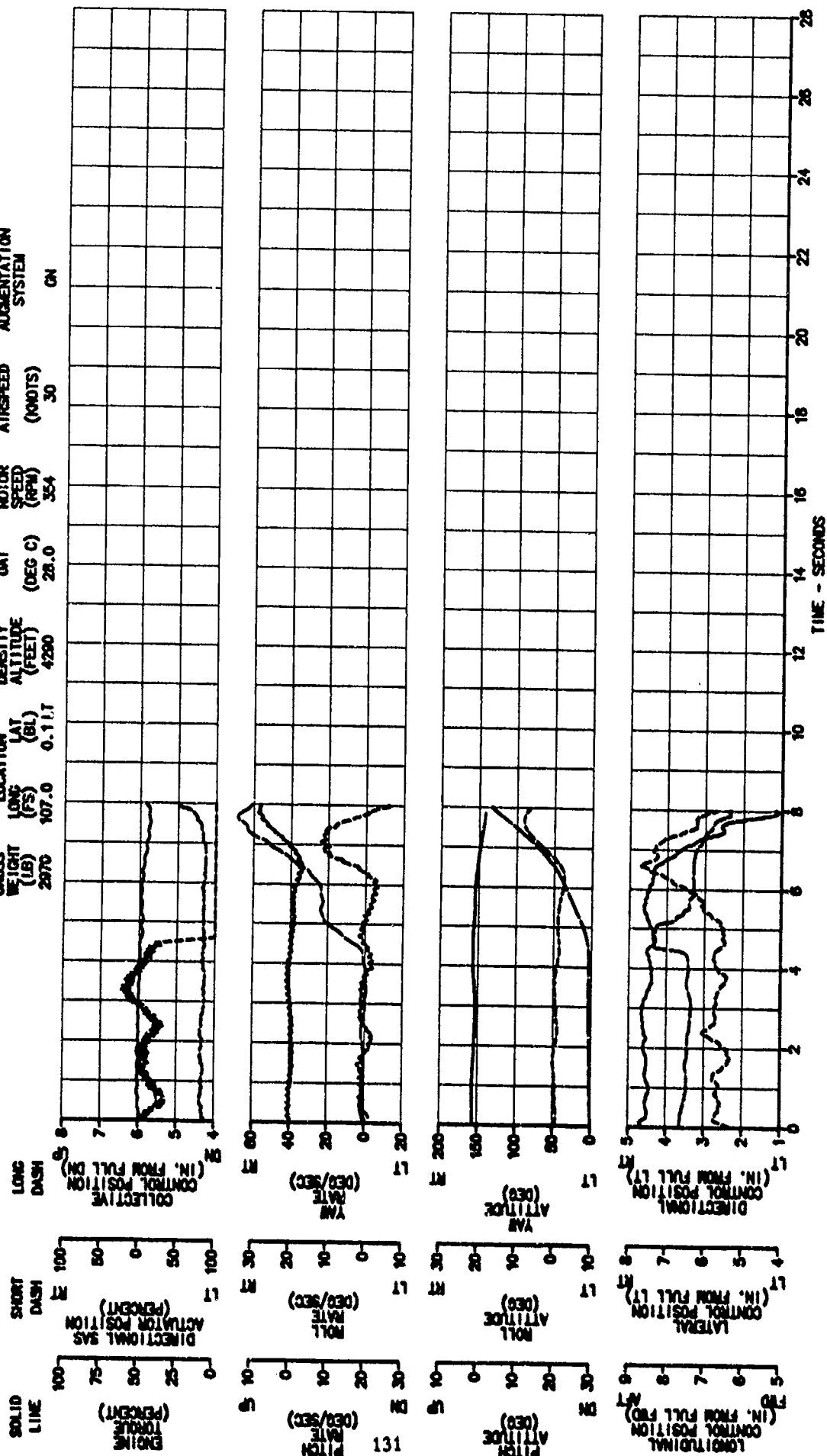


FIGURE E-36

RIGHT DIRECTIONAL PULSE INPUT - 210 DEGREE AZIMUTH

JOH-58C USA S/N 70-15349

AVG CROSS WEIGHT (LB)	2800	AVG CS LONG (FS)	107.0	AVG CS LAT (BL)	0.1 LT	AVG DENSITY ALT (DEG C)	28.5	TRIM ROTOR SPEED (RPM)	354	TRUE AIRSPEED (KNOTS)	30	STABILITY AUGMENTATION SYSTEM	OFF
-----------------------	------	------------------	-------	-----------------	--------	-------------------------	------	------------------------	-----	-----------------------	----	-------------------------------	-----

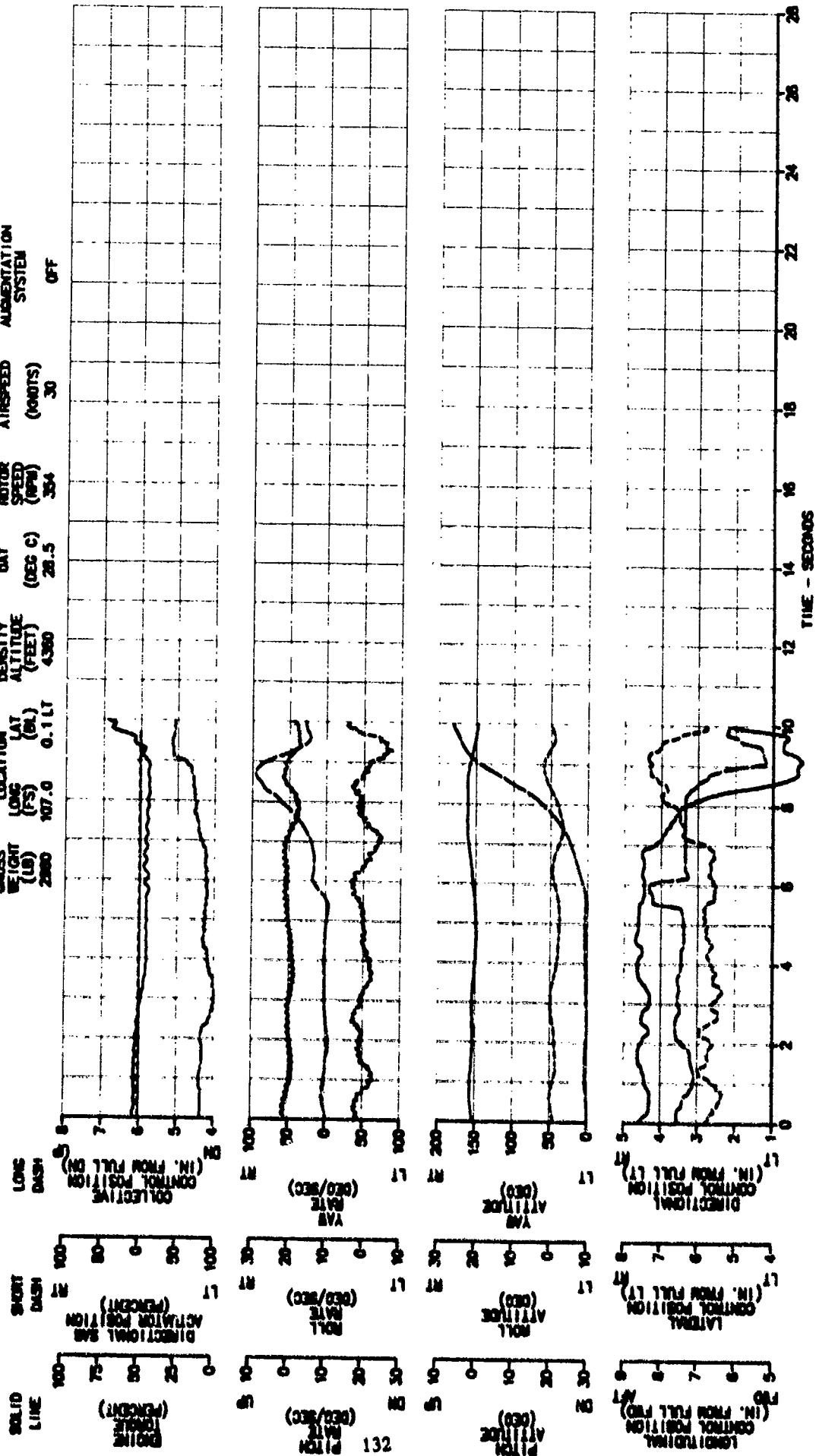


FIGURE E-97
LEFT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH

JM-58C USA S/N 70-15349

AVG CROSS WEIGHT (LB)	2870	AVG CS LOCATION	LONG (°S)	108.6	LAT (°N)	0.1 LT	AVG DENSITY	4170	AVG OAT (°C)	28.5	TRIM ROTOR SPEED (RPM)	353	TRUE AIRSPEED (KNOTS)	0	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	-----------------	-----------	-------	----------	--------	-------------	------	--------------	------	------------------------	-----	-----------------------	---	-------------------------------	----

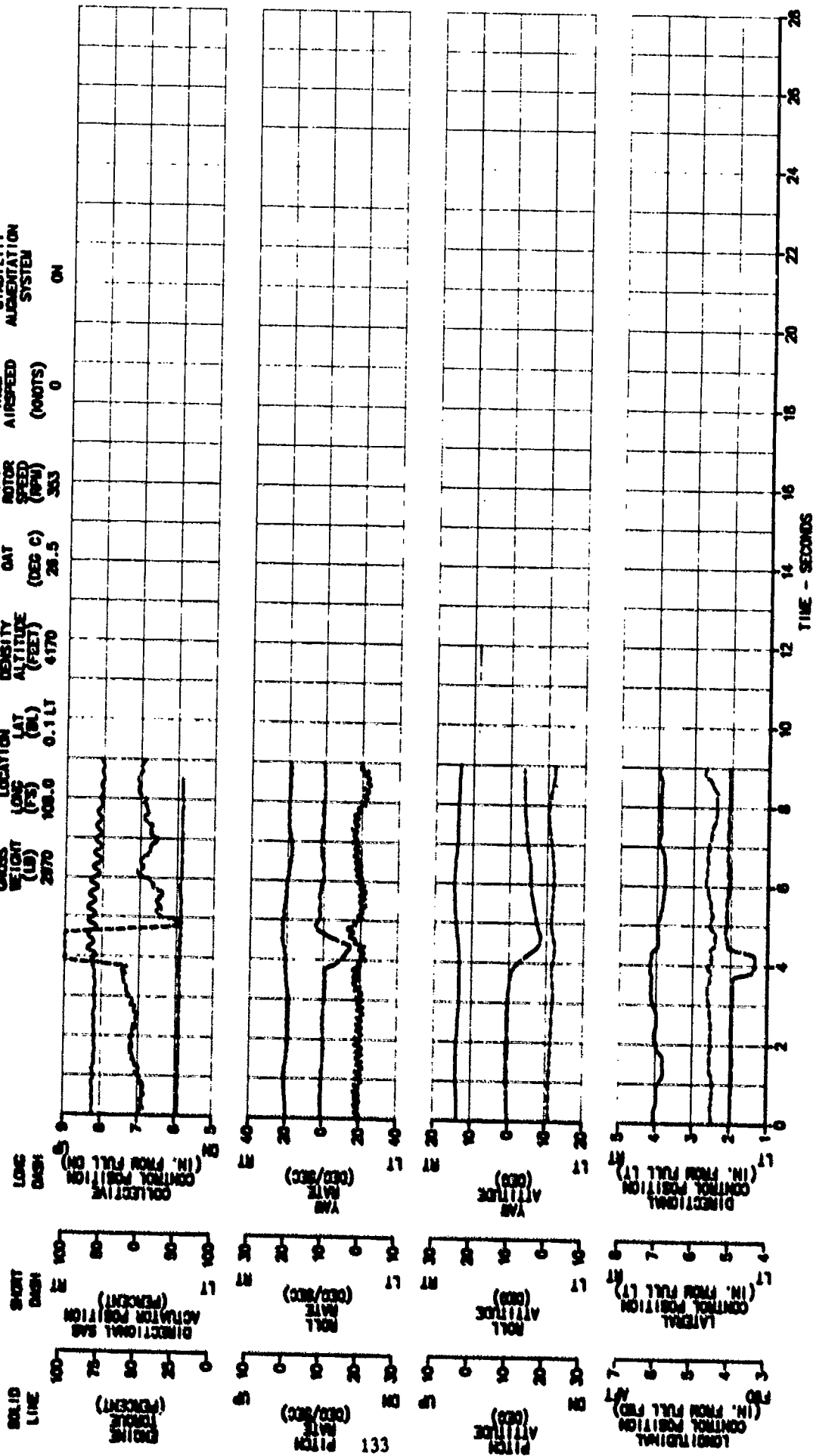


FIGURE E-98
LEFT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH

JOH-SEC UBA S/N 70-15346

AVG CROSS WEIGHT (LB)	AVG CS LOCATION (°S)	AVG DENSITY (°S)	AVG ALTITUDE (FEET)	TRIM ROTOR SPEED (RPM)	TRIM AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
2000	108.0	0.1 LT	4210	302	0	OFF

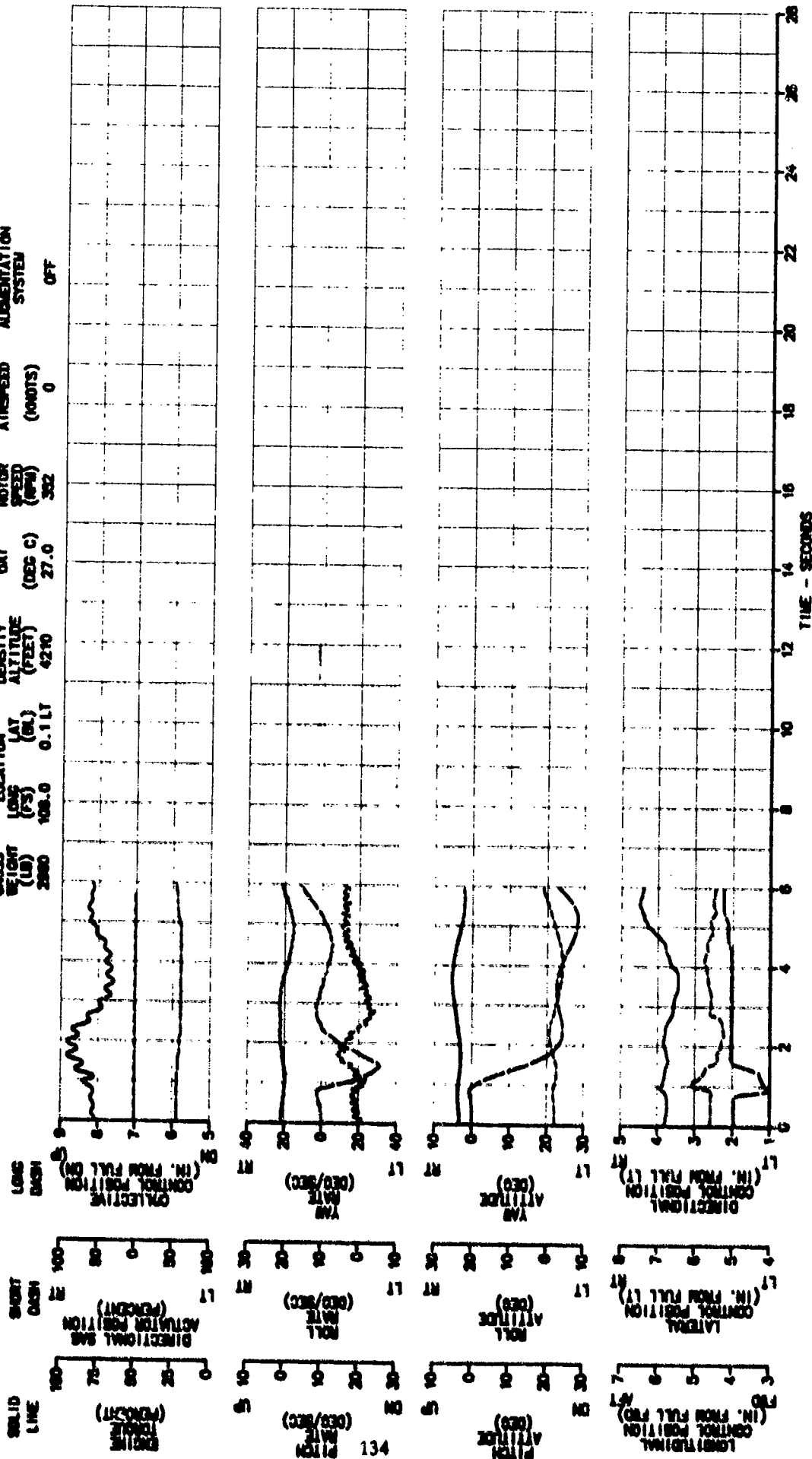


FIGURE E-99

RIGHT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH

JOM-SEC USA S/N 70-15349

AVG ORBS WEIGHT (LB)	AVG CS LOCATION	AVG DENSITY ALTITUDE (FEET)	AVG OAT (DEG C)	TRIM BOTOR SPEED (RPM)	TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
2000	100.0	0.117	27.0	353	0	ON

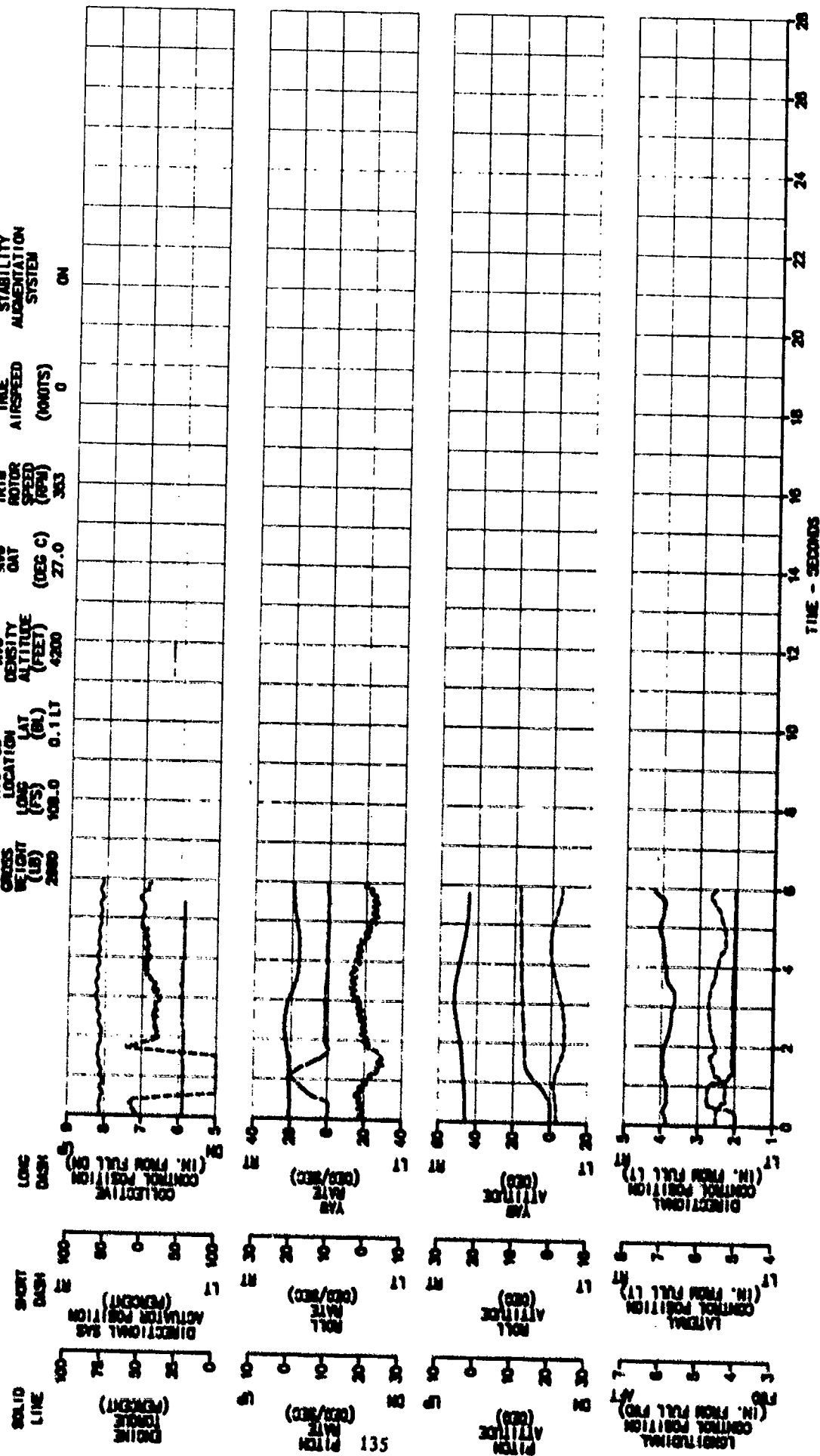


FIGURE E-100
RIGHT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH

JCH-50C USA S/N 70-15340

AVG CROSS WEIGHT (LB)	AVG CS LOCATION (LONG (PS) LAT (BL))	AVG DENSITY ALTITUDE (FEET)	AVG OAT (DEG C)	TRIM ROTOR SPEED (RPM)	TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
2860	108.6 0.1 LT	4340	27.5	304	0	OFF

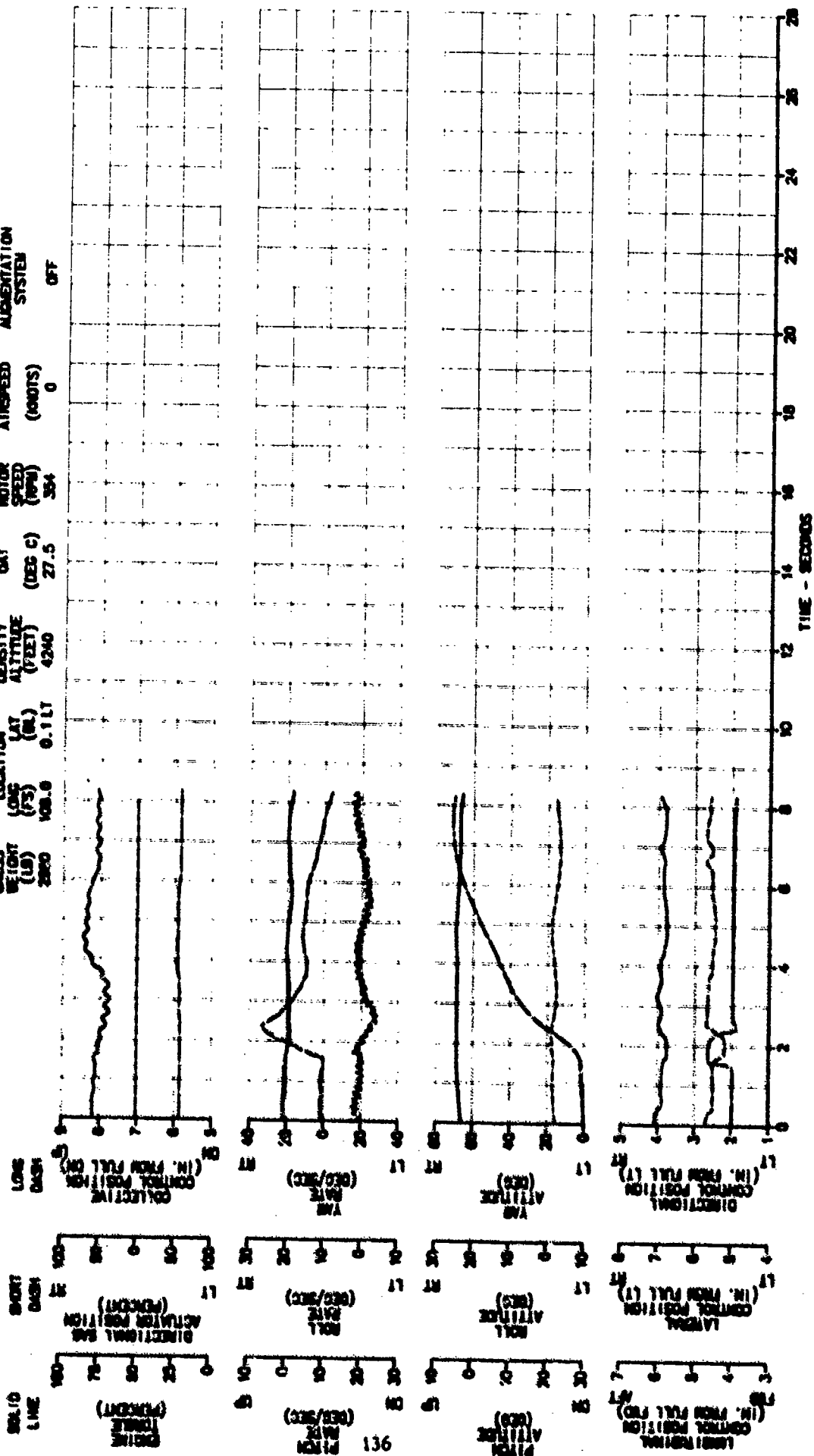


FIGURE E-101

LEFT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH

JOM-ONE USA S/N 70-15349

AVG CRG WEIGHT (LB) 2800
 LONG (FT) 108.9
 LAT (ML) 0.117
 DENSITY (DEG C) 27.5
 ROTOR SPEED (RPM) 306
 TRIM AIRSPEED (KNOTS) 10
 STABILITY AUGMENTATION SYSTEM ON

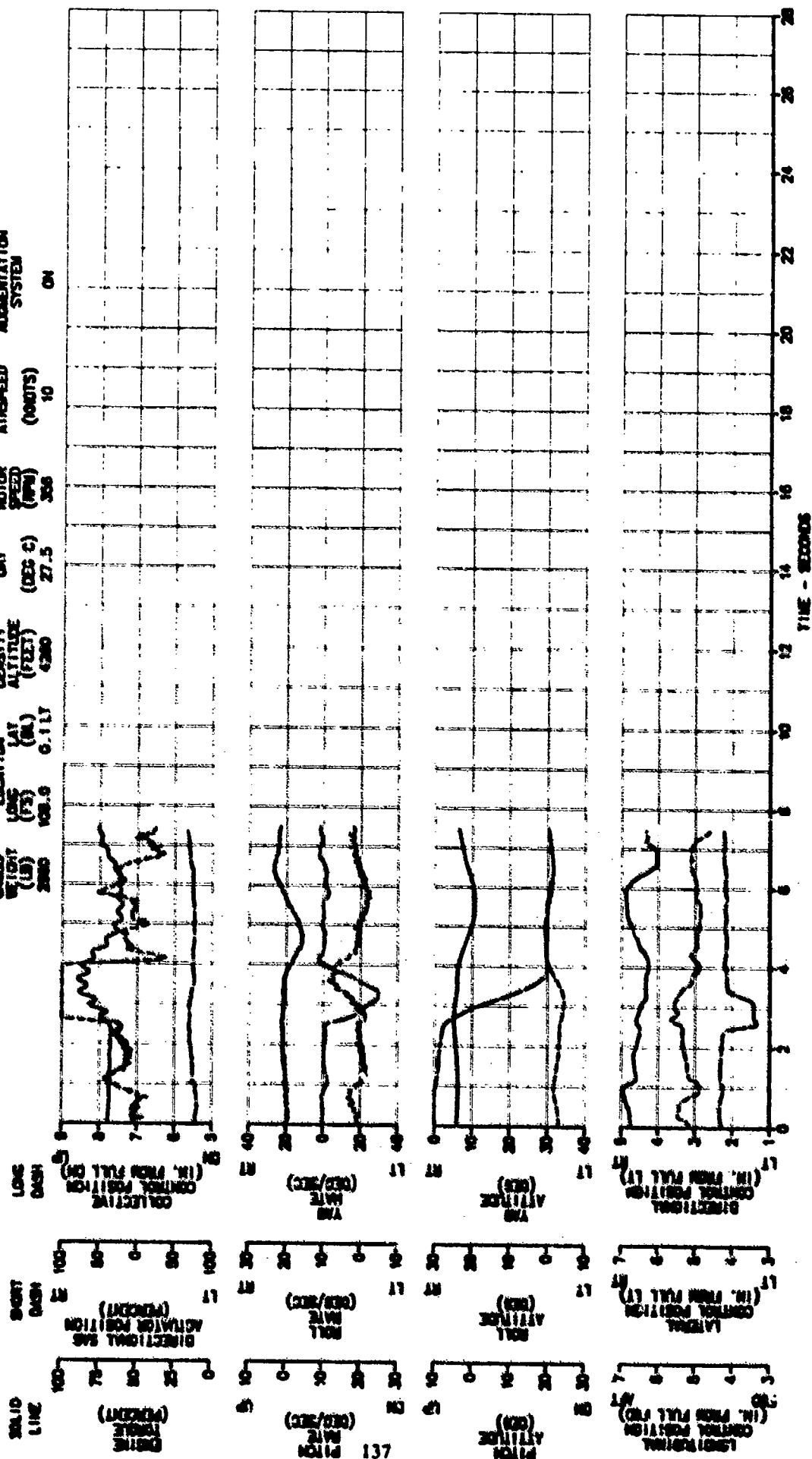


FIGURE E-102
LEFT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH
JCH-88C USA S/N 70-15348

AVG CROSS WEIGHT (LB) 2850
AVG CS LOCATION LONG (PS) 108.5 LAT (RL) 0.1 LT
AVG DENSITY ALT (DEG C) 27.5
TRUE AIRSPEED (KNOTS) 10
STABILITY AUGMENTATION SYSTEM QTF

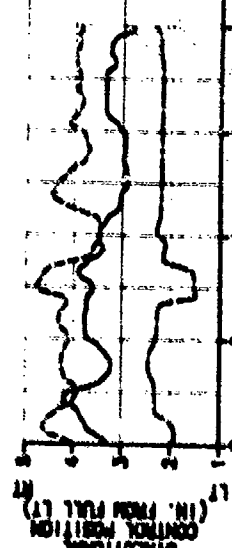
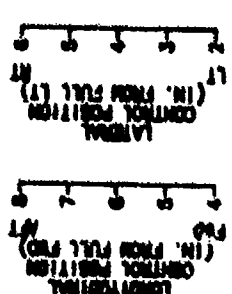
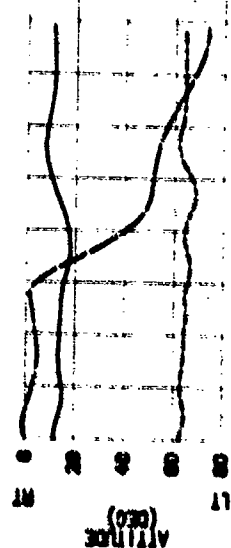
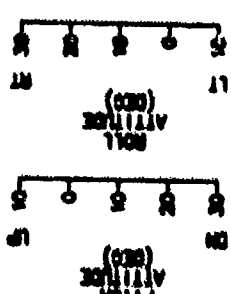
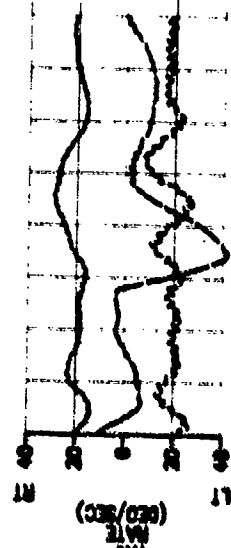
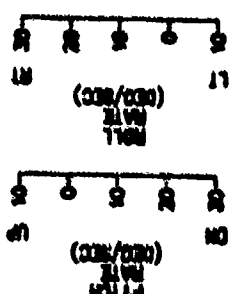
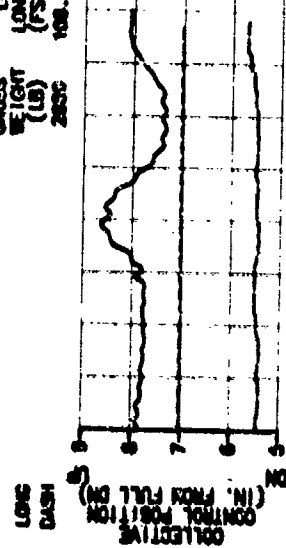
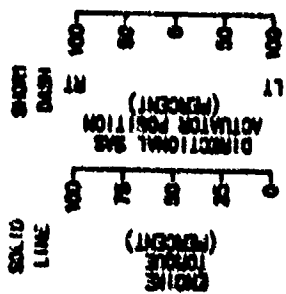


FIGURE E-103
RIGHT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH

JOH-58C USA S/N 70-15346

AVG CROSS WEIGHT (LB)	2500	AVG CO LONG (FS)	108.0	AVG CO LAT (BL)	0.1 LT	AVG DENSITY ALTITUDE (FEET)	4270	AVG UAT (DEG C)	27.5	TRIM ROTOR SPEED (RPM)	354	TRUE AIRSPEED (KNOTS)	10	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	------------------	-------	-----------------	--------	-----------------------------	------	-----------------	------	------------------------	-----	-----------------------	----	-------------------------------	----

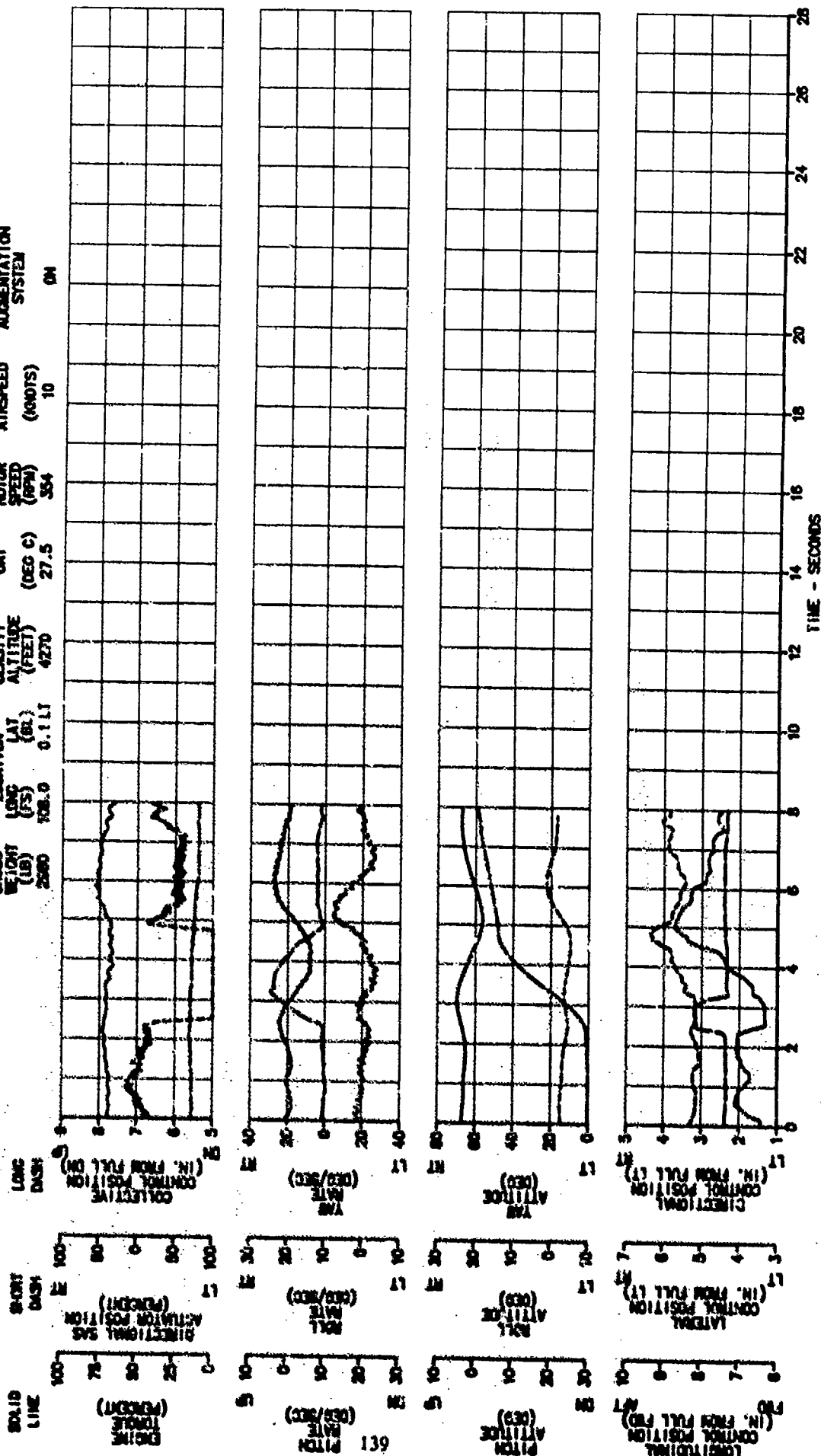
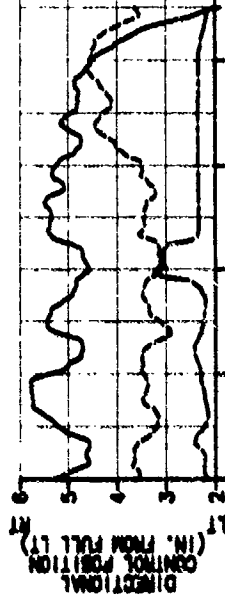
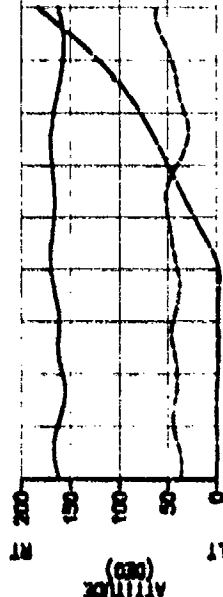
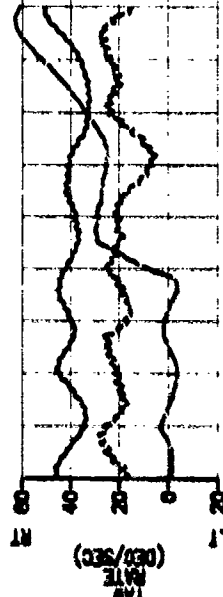
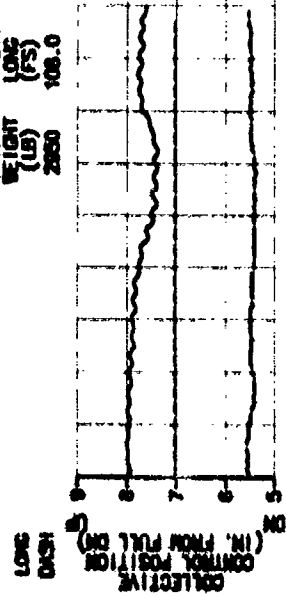
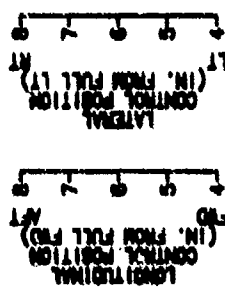
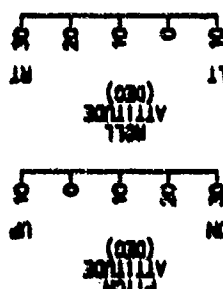
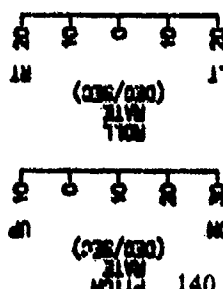
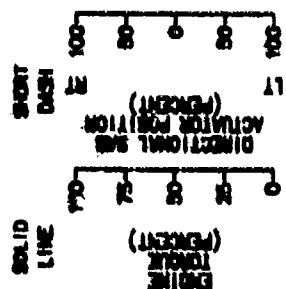


FIGURE E-104
RIGHT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH
JCN-08C URA S/N 70-18348

AVG GROSS WEIGHT (LB)	2850	AVG CS LOCATION (FS)	108.0	LAT (BL)	0.117	AVG DENSITY	4270	AVG ALTITUDE (DEG C)	27.5	TRIM	352	TIME AIRSPEED (KNOTS)	10	STABILITY AUGMENTATION SYSTEM	OFF
-----------------------	------	----------------------	-------	----------	-------	-------------	------	----------------------	------	------	-----	-----------------------	----	-------------------------------	-----



TIME - SECONDS

FIGURE E-105

LEFT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH

JOH-58C USA S/N 70-15349
 TRLE AIRSPEED (KNOTS) 20
 STABILITY AUGMENTATION SYSTEM ON
 TRIM ROTOR SPEED (RPM) 353
 AVG QAT (DEG C) 28.5
 AVG ALTITUDE (FEET) 4480
 LONG (FS) 107.6
 LAT (BL) 0.1 LT
 AVG CG LOCATION
 AVG GROSS WEIGHT (LB) 2880

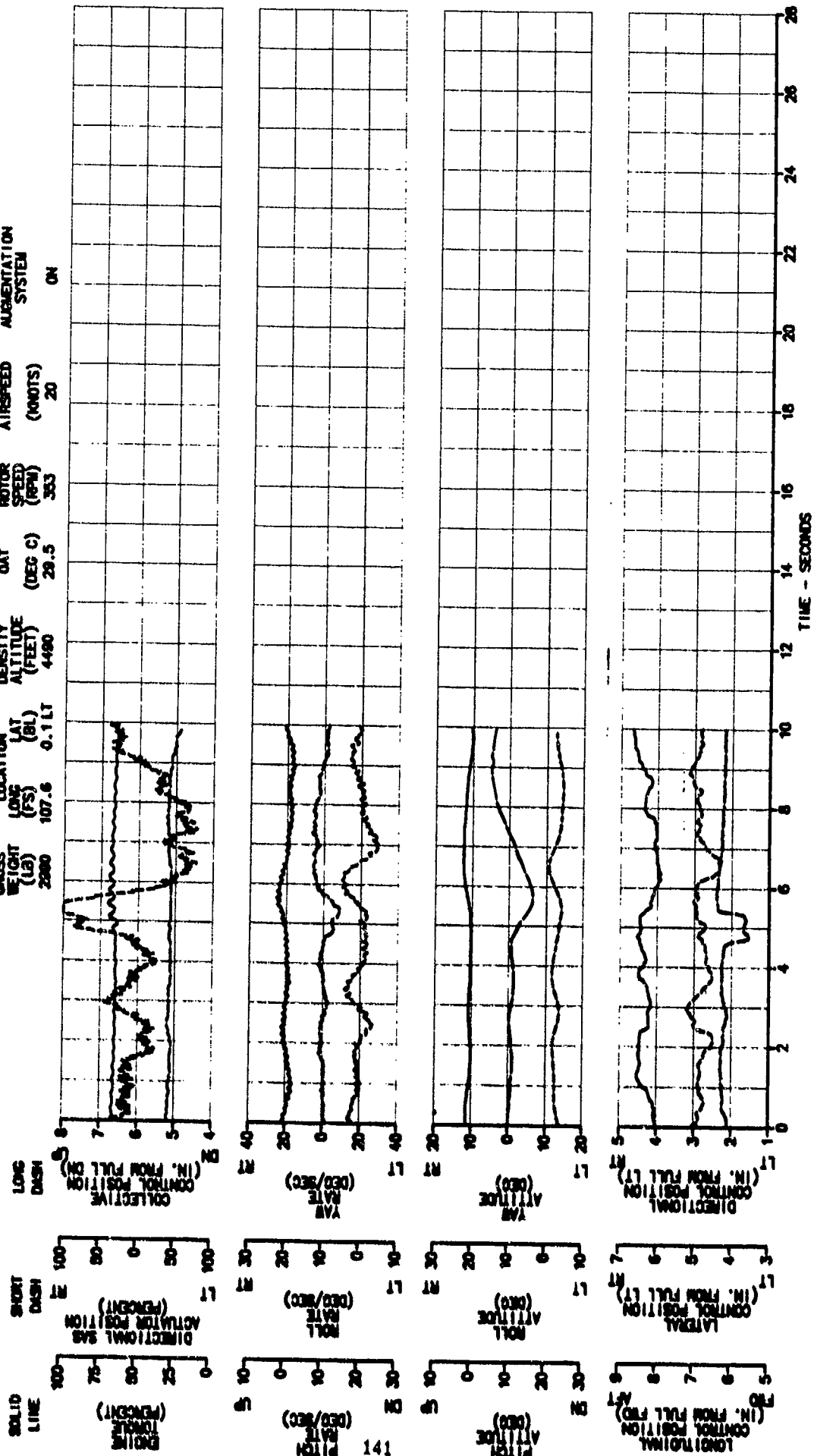


FIGURE E-107
RIGHT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH

JOM-58C USA S/N 70-15349
 AVG CROSS WEIGHT (LB) 2800
 LONG LOCATION (FS) 107.6
 LAT (BL) 0.1 LT
 AVG ALTITUDE (FEET) 4410
 AVG GAT (DEG C) 28.0
 TRIM ROTOR SPEED (RPM) 352
 TRUE AIRSPEED (KNOTS) 20
 STABILITY AUGMENTATION SYSTEM OFF

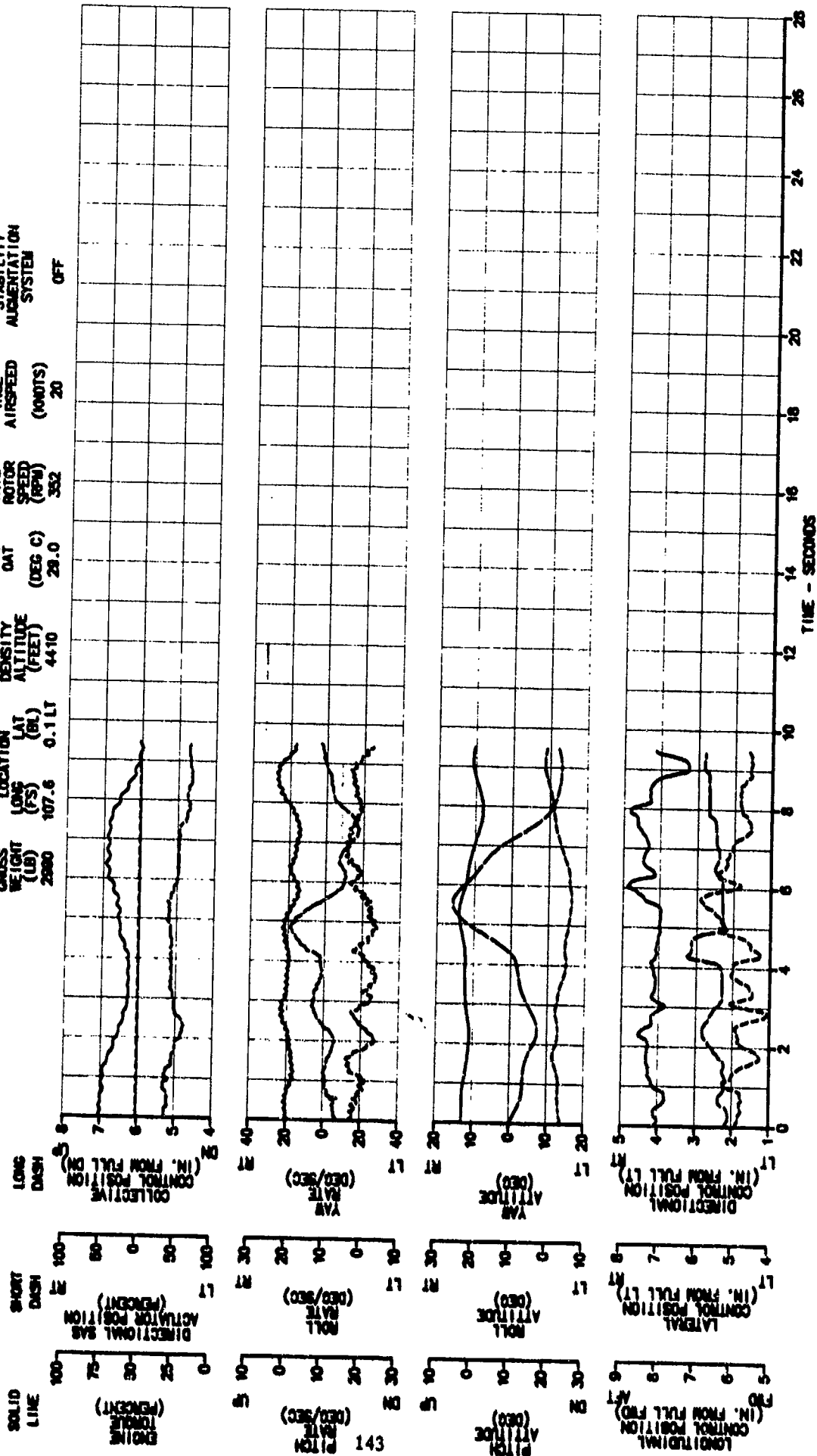
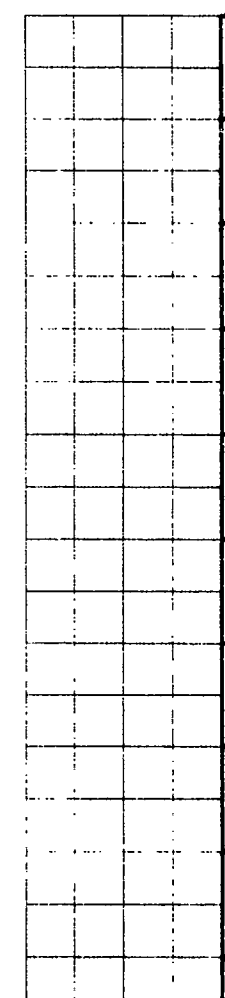
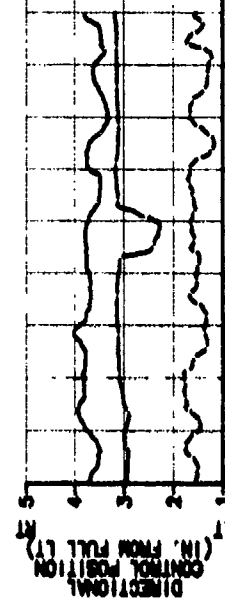
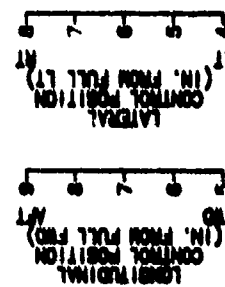
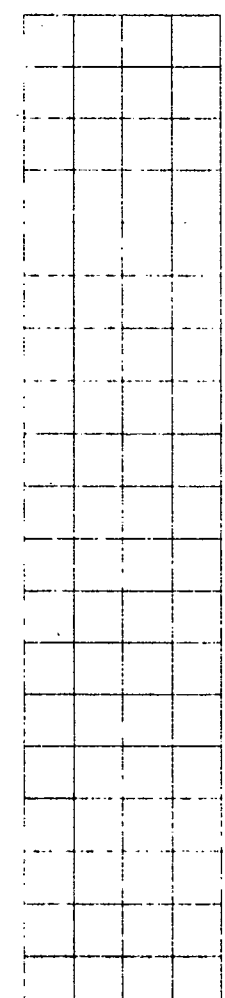
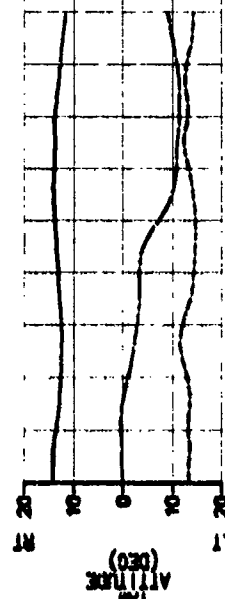
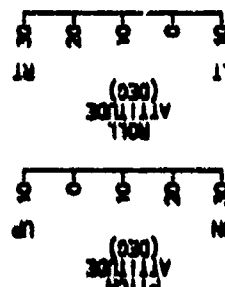
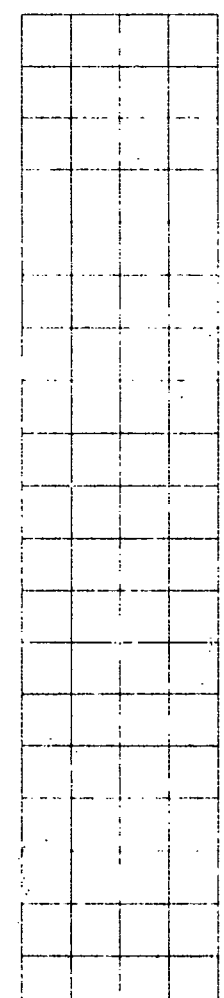
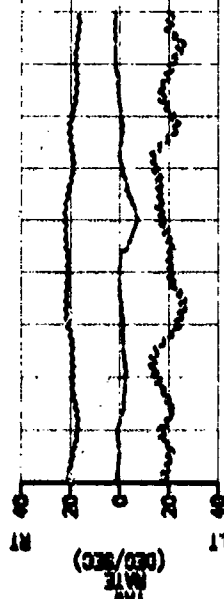
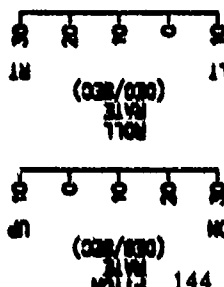
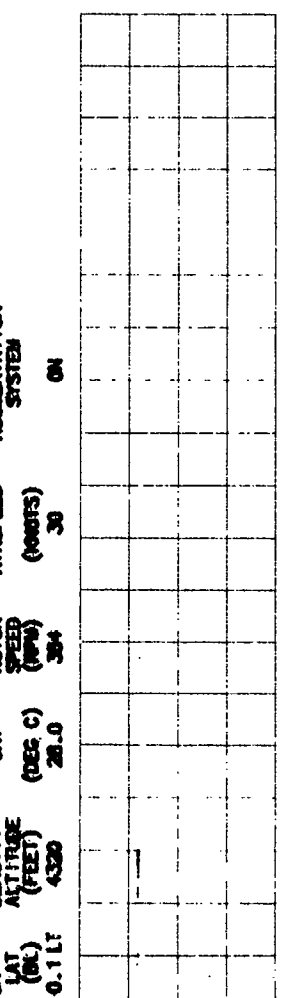
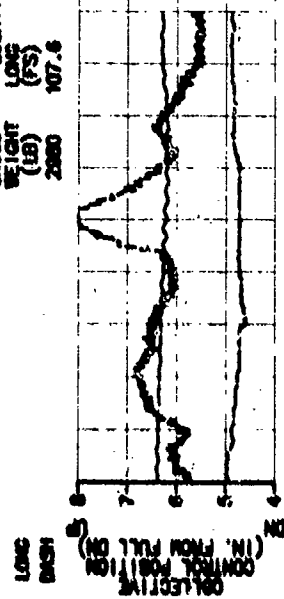
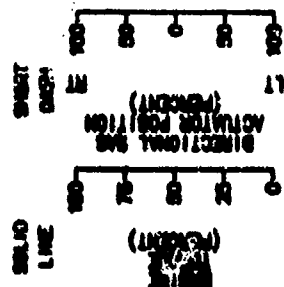


FIGURE E-106

LEFT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH

JAN-ONE USA S/N 70-13340

AVG CROSS WEIGHT (LB)	2000	AVG CG LONG (F5)	107.6	AVG CG LAT (ML)	0.1 LT	AVG DENSITY (DEG C)	28.0	TRIM ROTOR SPEED (RPM)	354	TRUE AIRSPEED (KNOTS)	30	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	------------------	-------	-----------------	--------	---------------------	------	------------------------	-----	-----------------------	----	-------------------------------	----



TIME - SECONDS

FIGURE E-109

LEFT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH

JOH-58C USA S/N 70-15348

AVG GROSS WEIGHT (LB)	2970	AVG CG LOCATION	107.5	AVG ALTITUDE (FEET)	4220	AVG OAT (DEG C)	27.0	TRIM SPEED (RPM)	306	TRUE AIRSPEED (KNOTS)	30	STABILITY AUGMENTATION SYSTEM	OFF
-----------------------	------	-----------------	-------	---------------------	------	-----------------	------	------------------	-----	-----------------------	----	-------------------------------	-----

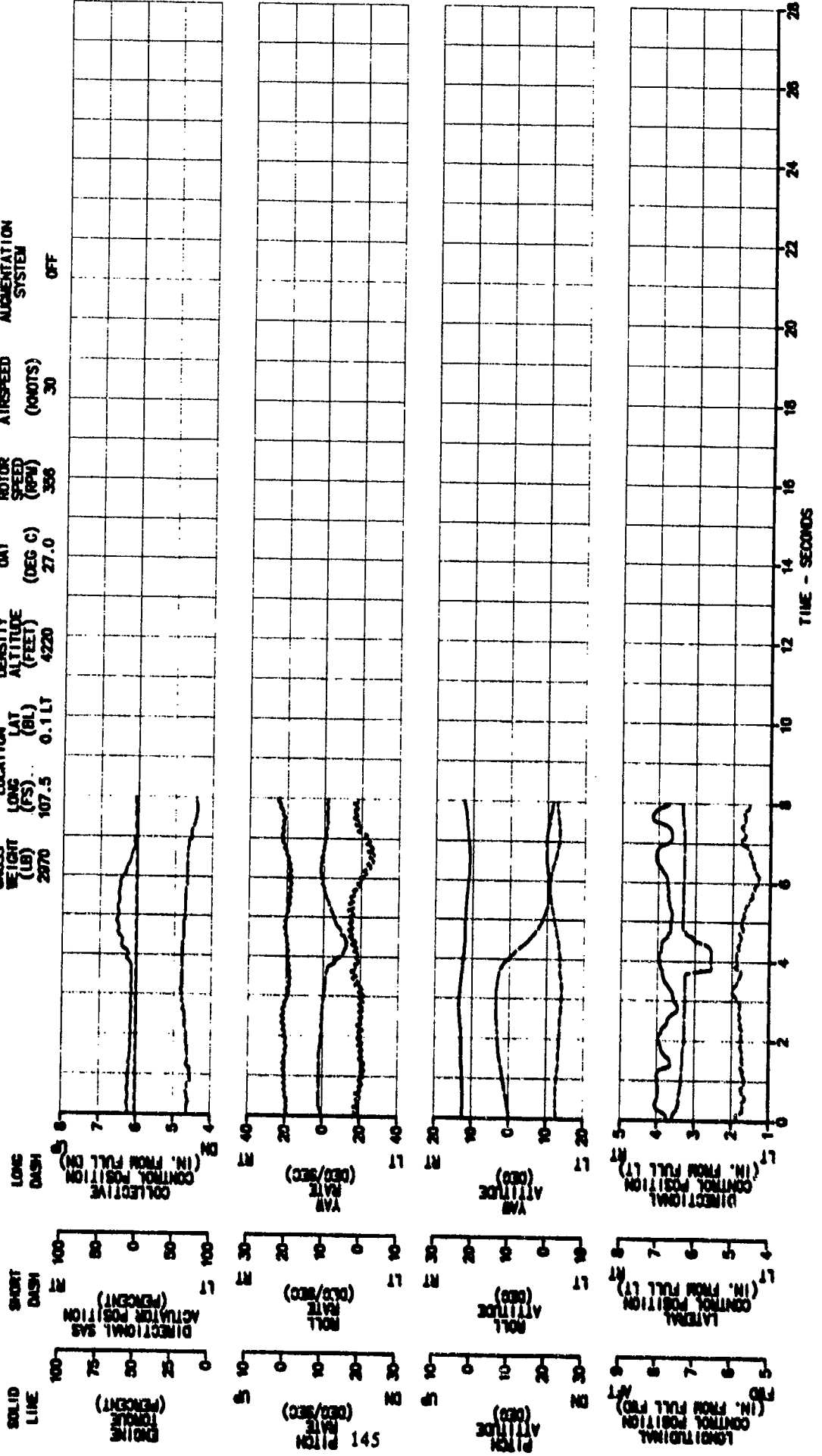
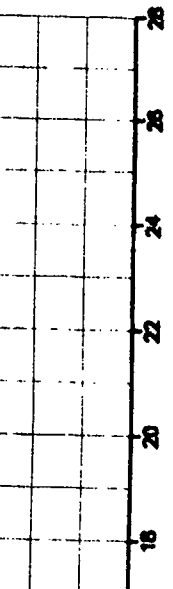
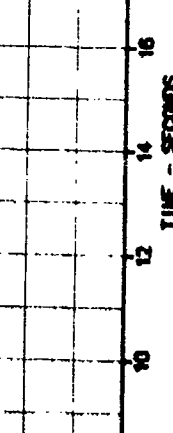
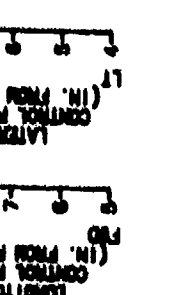
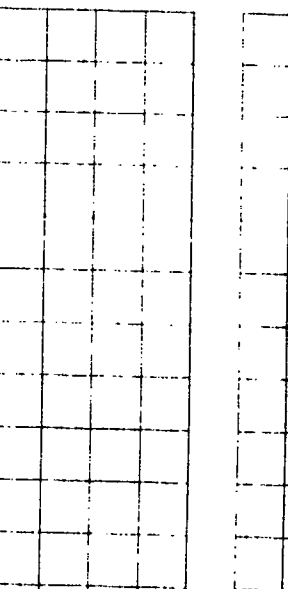
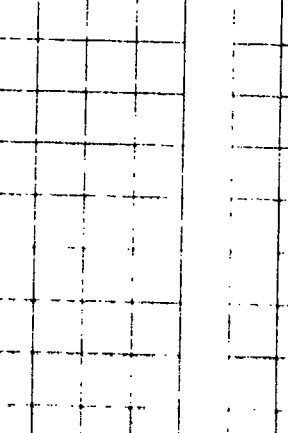
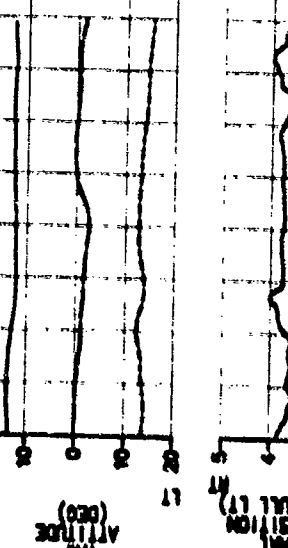
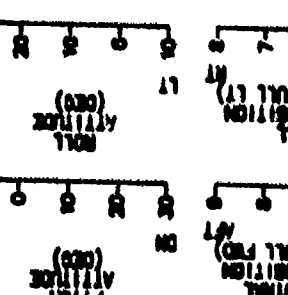
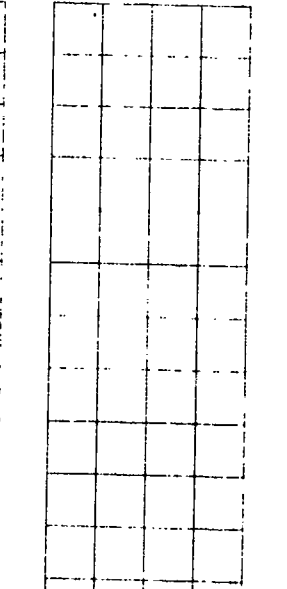
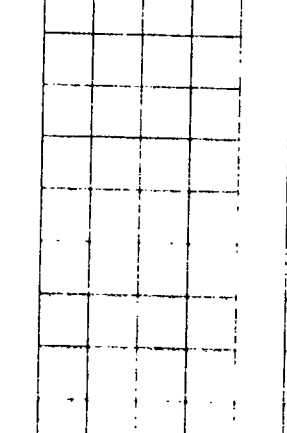
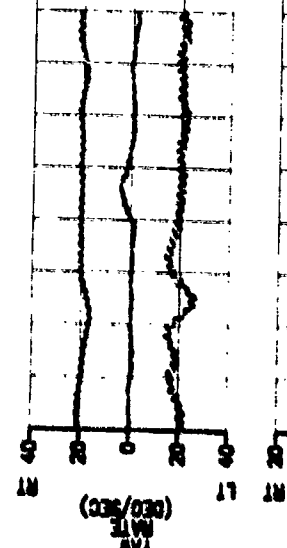
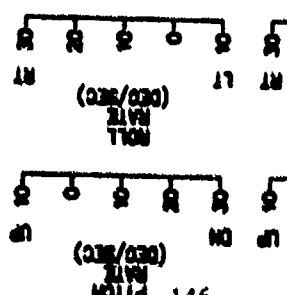
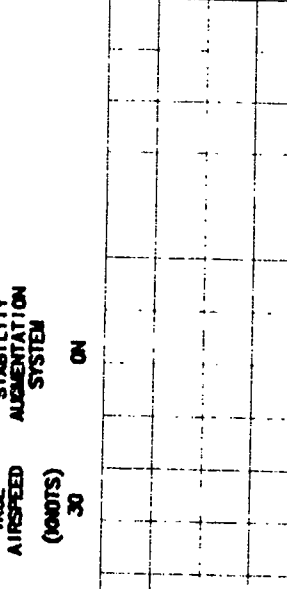
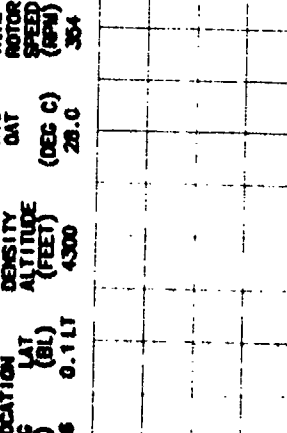
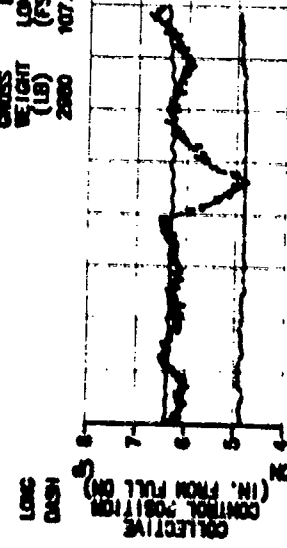
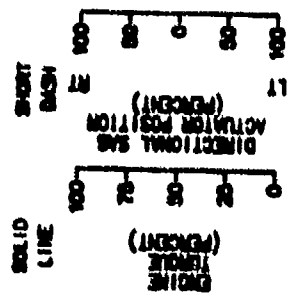


FIGURE E-110
RIGHT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH

JNH-38C USA S/N 70-15348
 AVG CROSS WEIGHT (LB) 2000
 AVG CS LONG (FS) 107.6
 LAT (BL) 0.1 LT
 DENSITY ALT (FEET) 4300
 OAT (DEG C) 28.0
 TRIM SPEED (KNOTS) 304
 TRUE AIRSPEED (KNOTS) 30
 STABILITY AUGMENTATION SYSTEM ON



TIME - SECONDS

FIGURE E-111
RIGHT DIRECTIONAL PULSE INPUT - 240 DEGREE AZIMUTH

JON-88C USA S/N 70-15348
 TRIM ROTOR SPEED (RPM) 368
 TRUE AIRSPEED (KNOTS) 30
 STABILITY AUGMENTATION SYSTEM OFF
 AVG CO LOCATION LONG 107.5 LAT 0.1 LT
 AVG ALTITUDE (FEET) 4250
 AVG DENSITY ALT (DEG C) 27.5
 AVG GROSS WEIGHT (LB) 2870

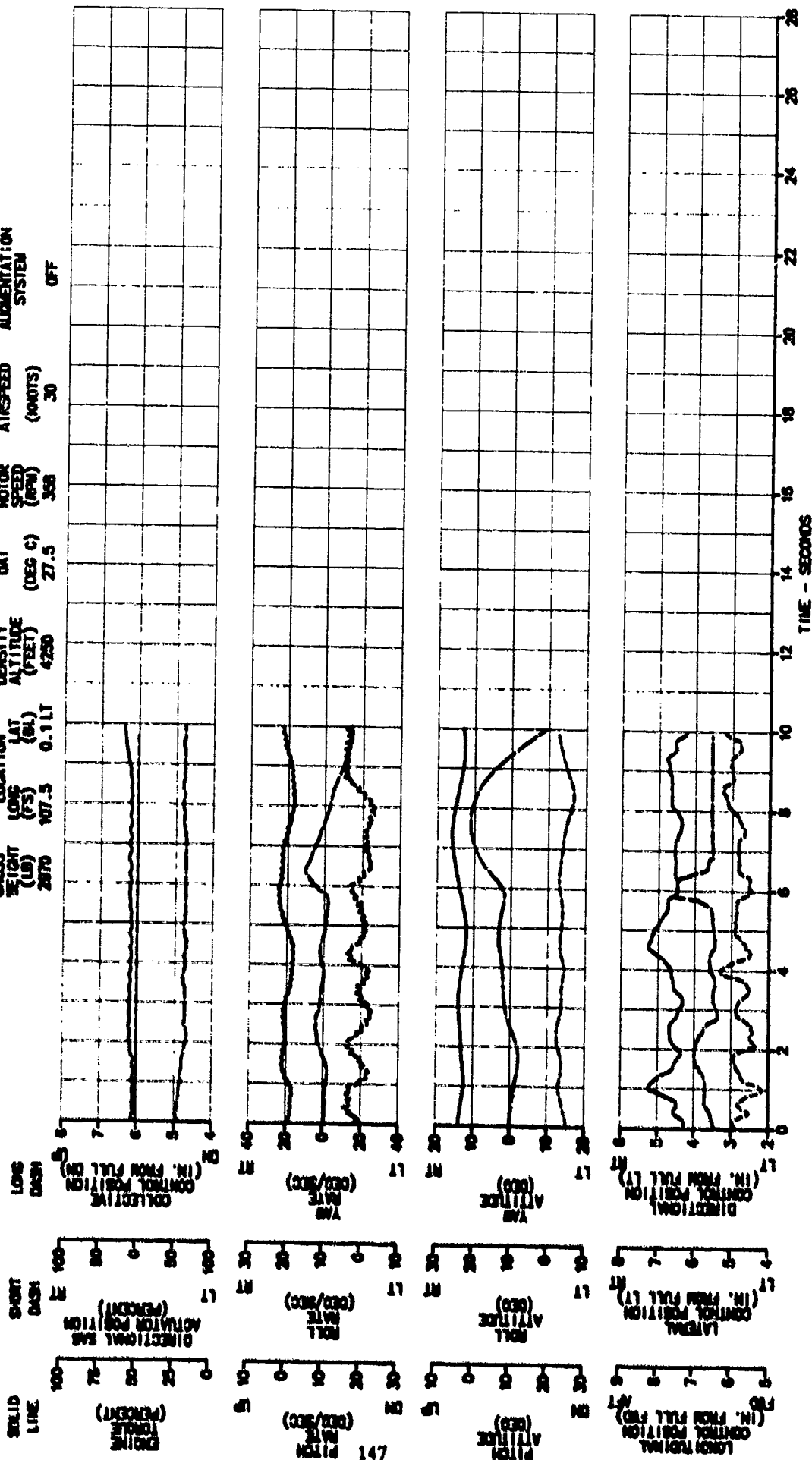


FIGURE E-112
LEFT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH

01-59C USA S42 70-15340

AVG QAT	TRIM MOTOR SPEED (RPM)	TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
26.5	352	0	ON

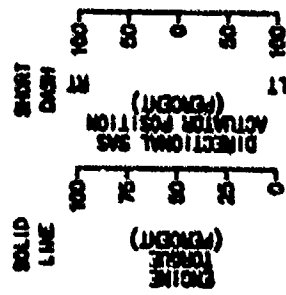


FIGURE E-113
LEFT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH

JOM-58C USA S/N 70-15349
 AVG CROSS WEIGHT (LB) 2970
 AVG CS LONG (°S) 108.7
 LAT (°N) 0.117
 DENSITY (G/CM³) 4.280
 ALTITUDE (FEET) 4280
 AVG OAT (°C) 27.5
 ROTOR SPEED (RPM) 353
 TRUE AIRSPEED (KNOTS) 0
 STABILITY AUGMENTATION SYSTEM OFF

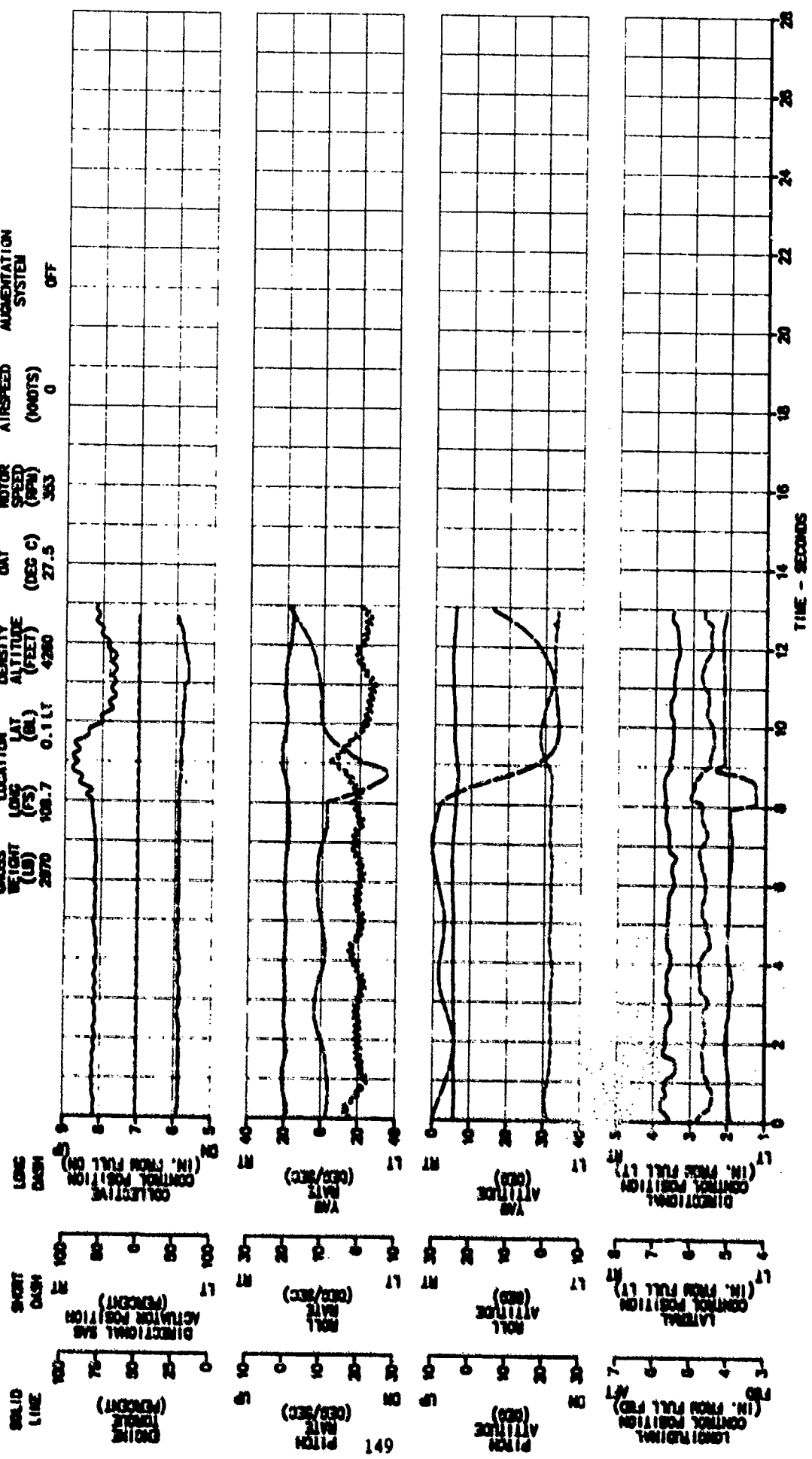


FIGURE E-114
RIGHT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH
JEP-88C USA S/N 70-15346

STABILITY
AUGMENTATION
SYSTEM
ON

TRUE
AIRSPEED
(KNOTS)
0

TRIM
ROTOR
SPEED
(RPM)
302

AWS
CAT
(DEG C)
27.0

AWS
DENSITY
ALTITUDE
(FEET)
4240

AWS
LOCATION
LAT
(N)
0.1 LT

AWS
LONG
(E)
108.7

AWS
WEIGHT
(LB)
2000

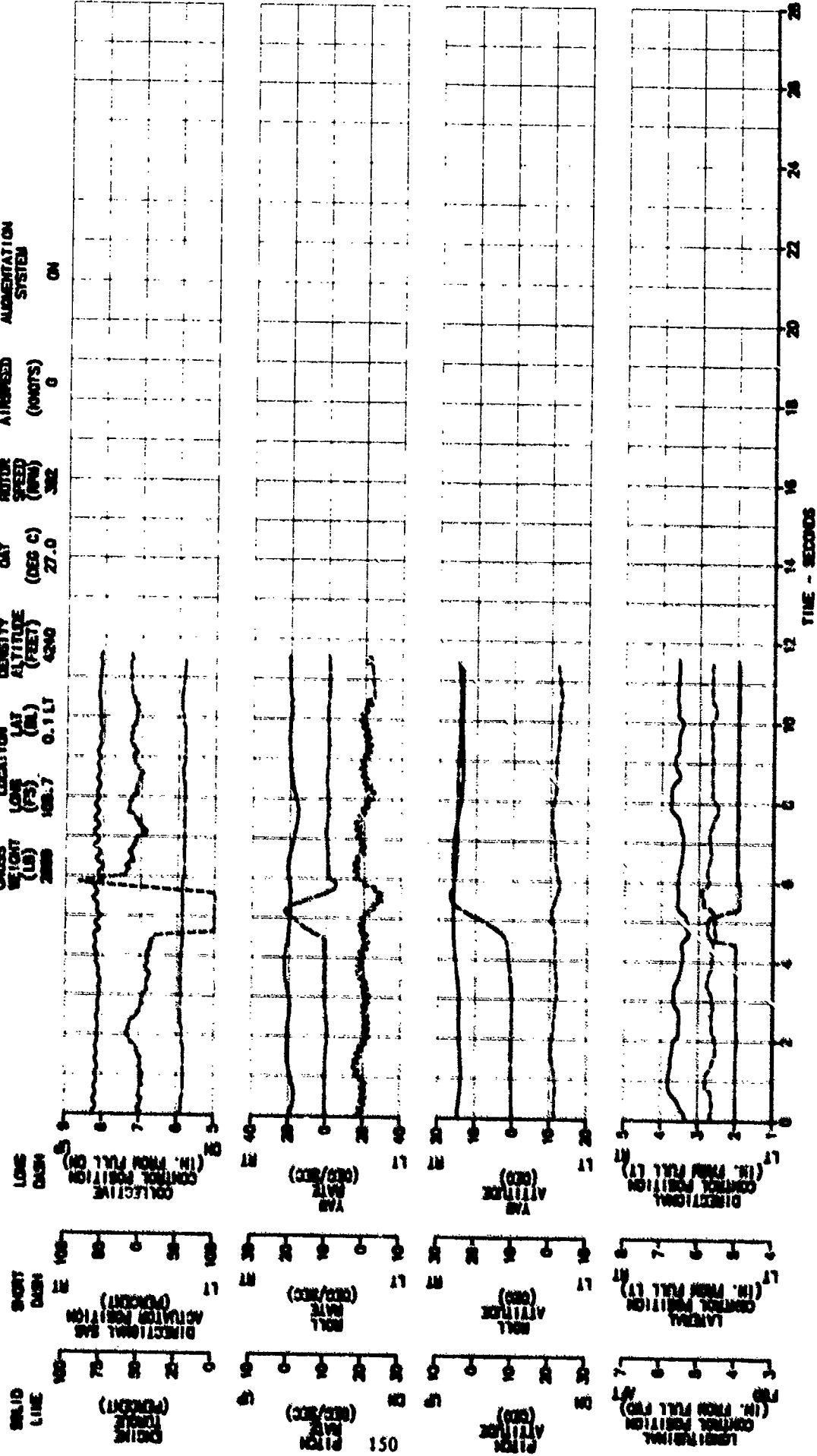


FIGURE E-115
RIGHT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH

JOH-58C USA S/N 70-15349
 AVO CO LONG LAT AVO DENSITY ALTITUDE (DEG C) TRIN ROTOR SPEED (RPM) TRUE AIRSPEED (KNOTS) STABILITY AUGMENTATION SYSTEM
 2070 109.7 0.11 4310 28.0 352 0 OFF

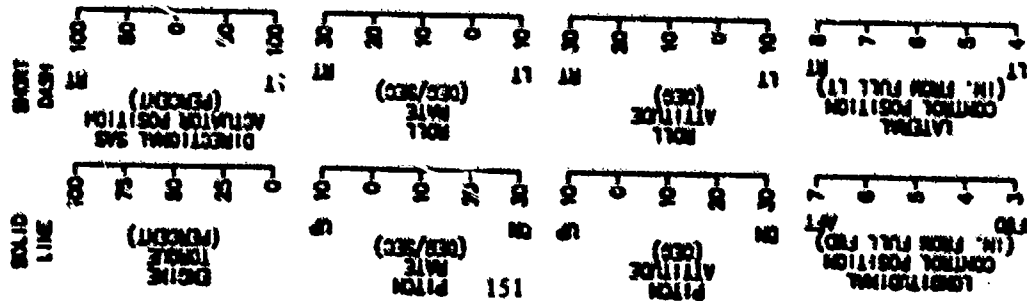
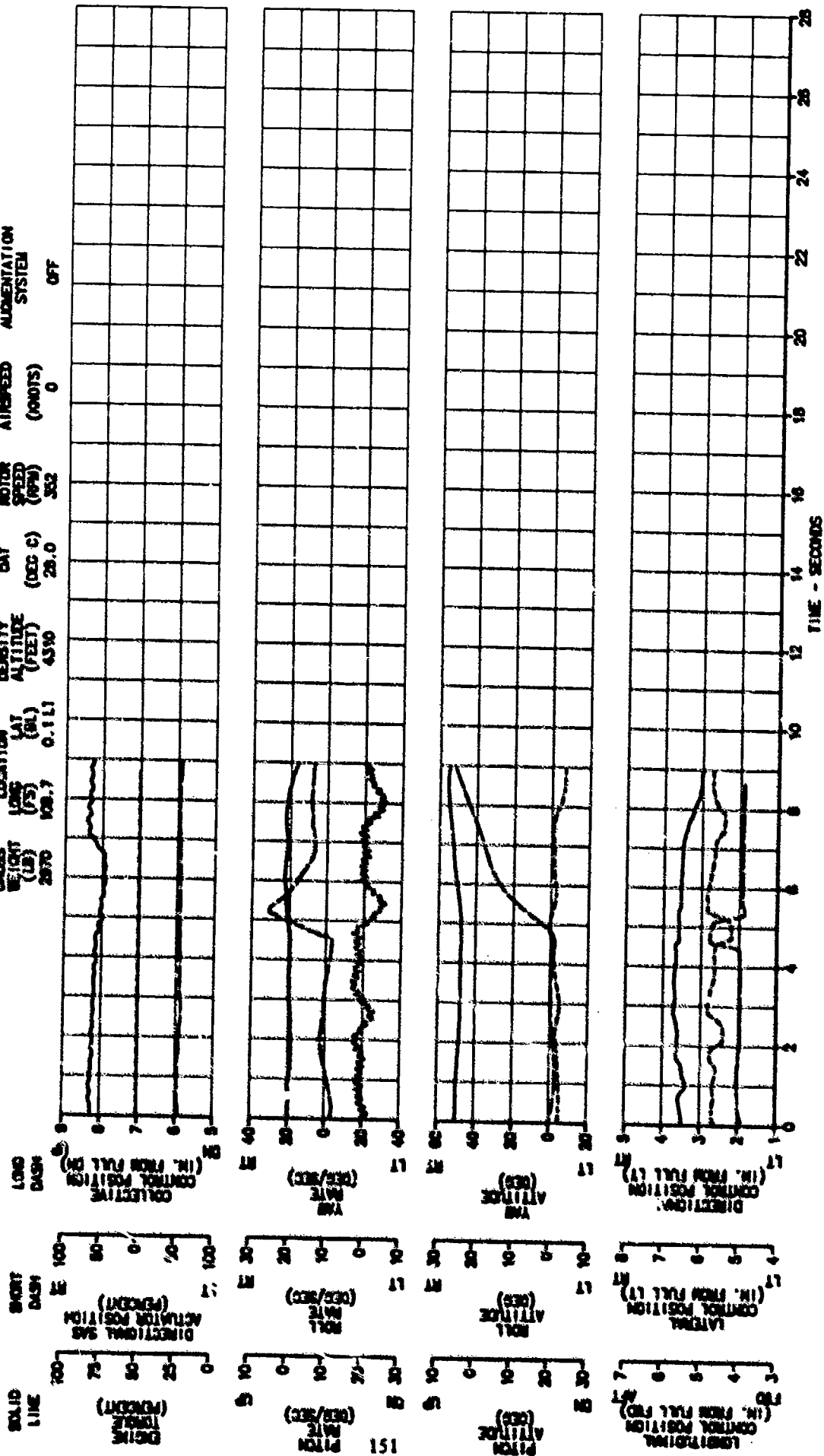
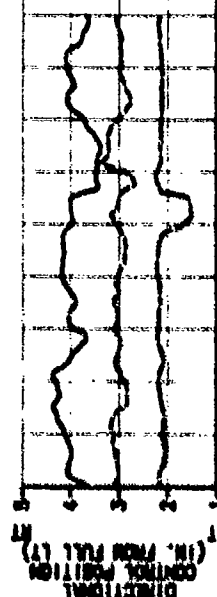
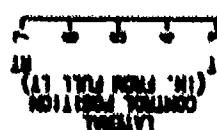
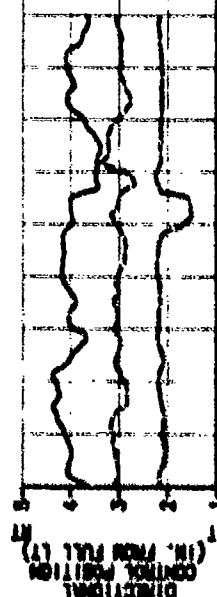
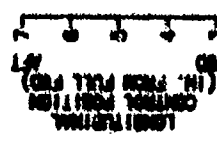
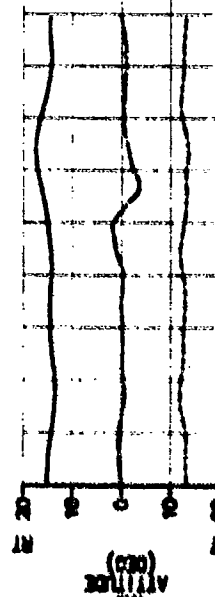
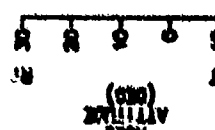
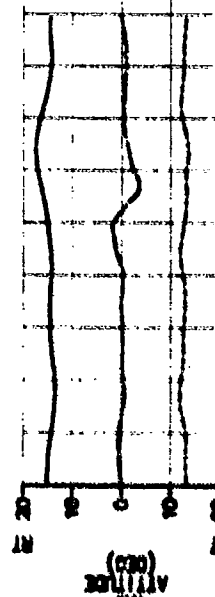
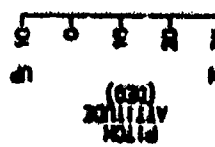
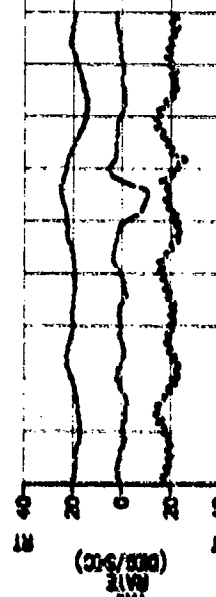
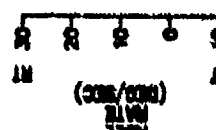
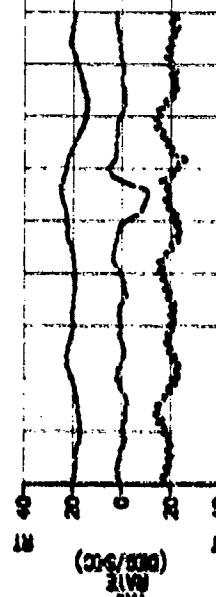
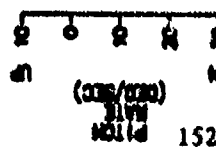
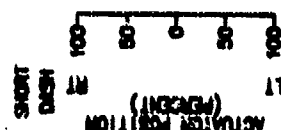
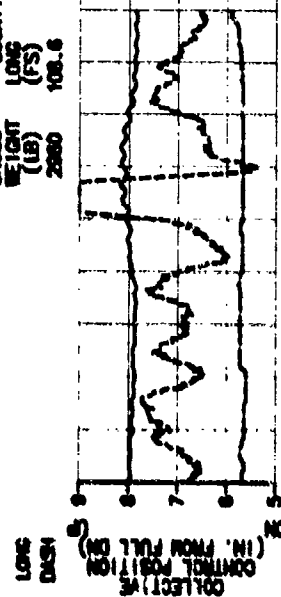
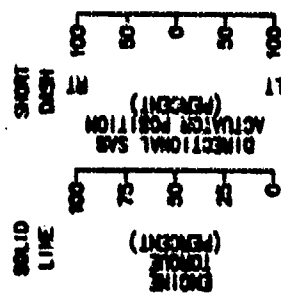


FIGURE E-116
LEFT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH

JON-500 USA S/N 70-15349

AVG GROSS WEIGHT (LB)	2000	AVG CS LONG (FS)	108.6	AVG CS LAT (BL)	0.1 LT	AVG DENSITY ALTITUDE (FEET)	4250	AVG OAT (DEG C)	27.5	TRIM MOTOR SPEED (RPM)	354	TRUE AIRSPEED (KNOTS)	10	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	------------------	-------	-----------------	--------	-----------------------------	------	-----------------	------	------------------------	-----	-----------------------	----	-------------------------------	----



TIME - SECONDS

FIGURE E-117
LEFT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH

JOH-30C USA S/N 70-15349
 TRUE AIRSPEED (KNOTS) 10
 STABILITY AUGMENTATION SYSTEM OFF
 TRIM MOTOR SPEED (RPM) 305
 AVG DENSITY ALT (DEG C) 27.0
 AVG ALTITUDE (FEET) 4180
 AVG CS LAT (ML) 0.1 LT
 AVG CROSS WEIGHT (LB) 2880
 LONG DASH 128.6

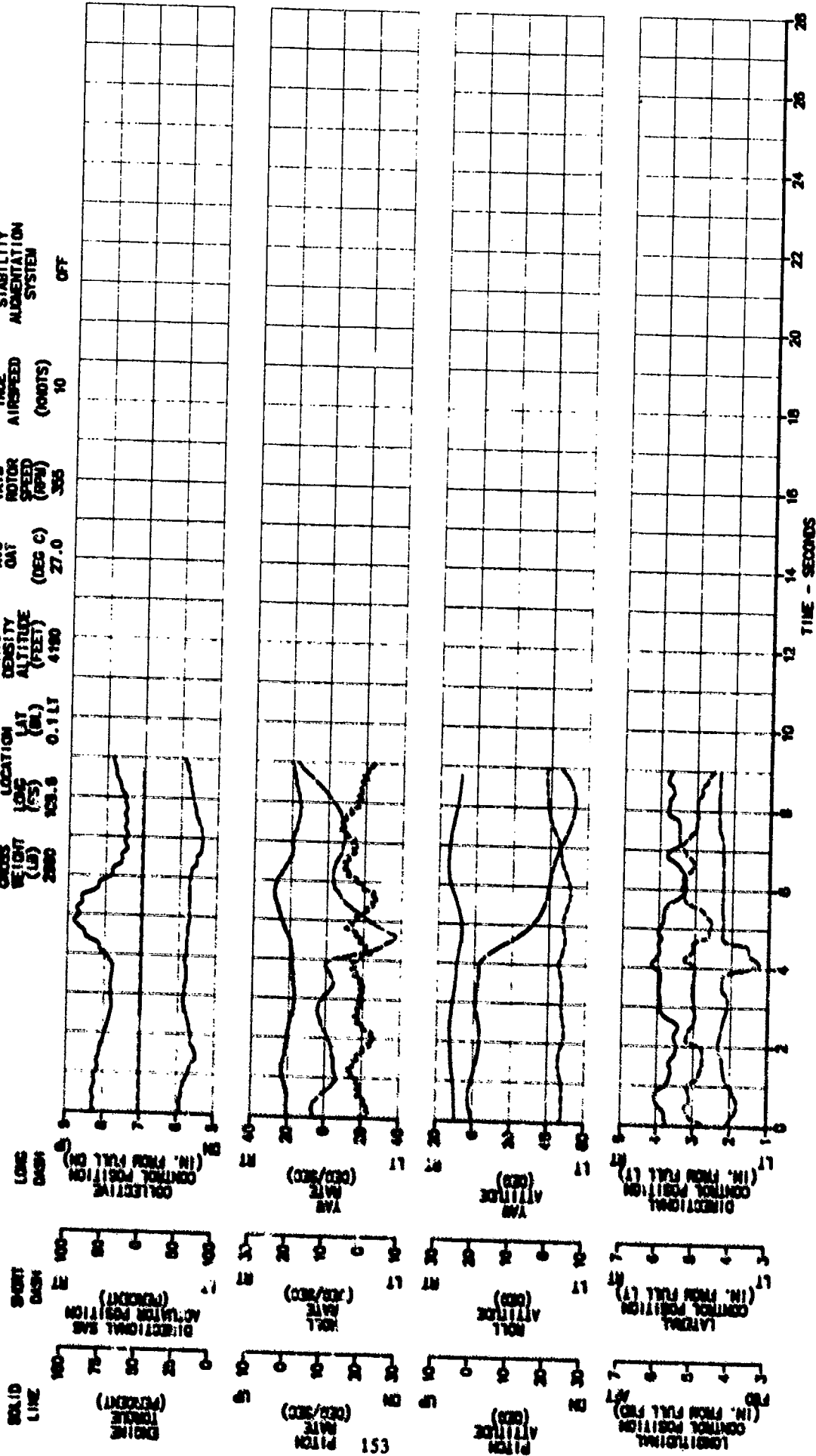
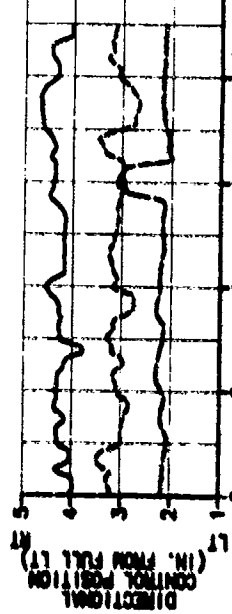
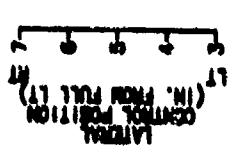
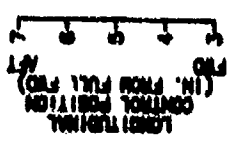
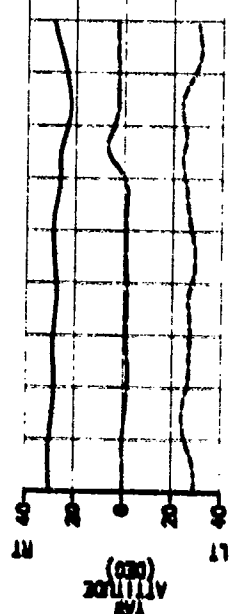
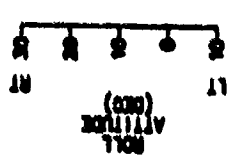
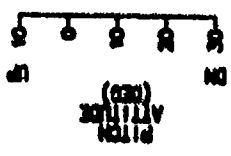
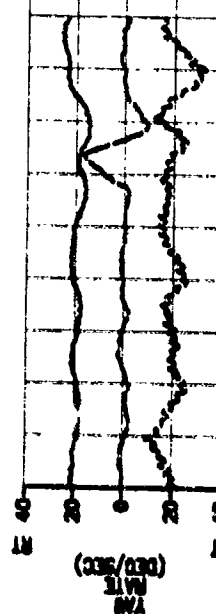
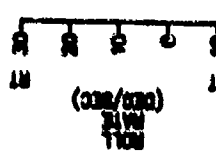
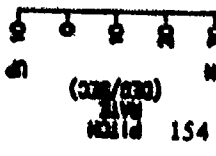
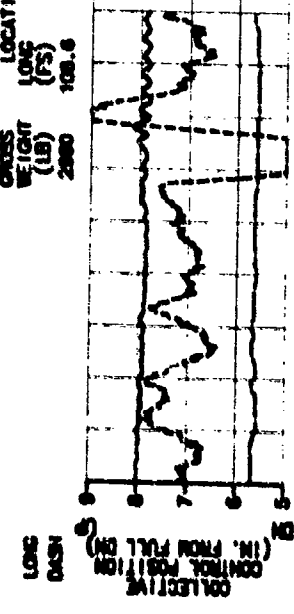
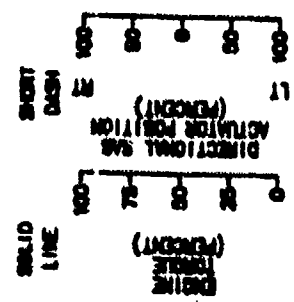


FIGURE E-118
RIGHT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH
JCH-88C USA S/N 70-13348

AVG CROSS WEIGHT (LB) 2880
AVG CS LONG (FS) 108.6
AVG LOCATION LAT (BL) 0.1 LT
AVG SENSITIVITY ALTITUDE (FEET) 4210
AVG GAT (DEG C) 27.0
TRUE AIRSPEED (KNOTS) 10
STABILITY AUGMENTATION SYSTEM ON



TIME - SECONDS

FIGURE E-119

JOH-58C USA S/N 70-15349

AVG PRESS HEIGHT (LB)	AVG COB LOCATION LONG (FS)	AVG COB LAT (BL)	AVG DENSITY ALTITUDE (FEET)	AVG OAT (DEG C)	TRIM ROTOR SPEED (RPM)	TRUE AIRSPEED (KNOTS)	STABILITY Augmentation System
2060	108.6	0.1 LT	4180	28.5	353	10	OFF

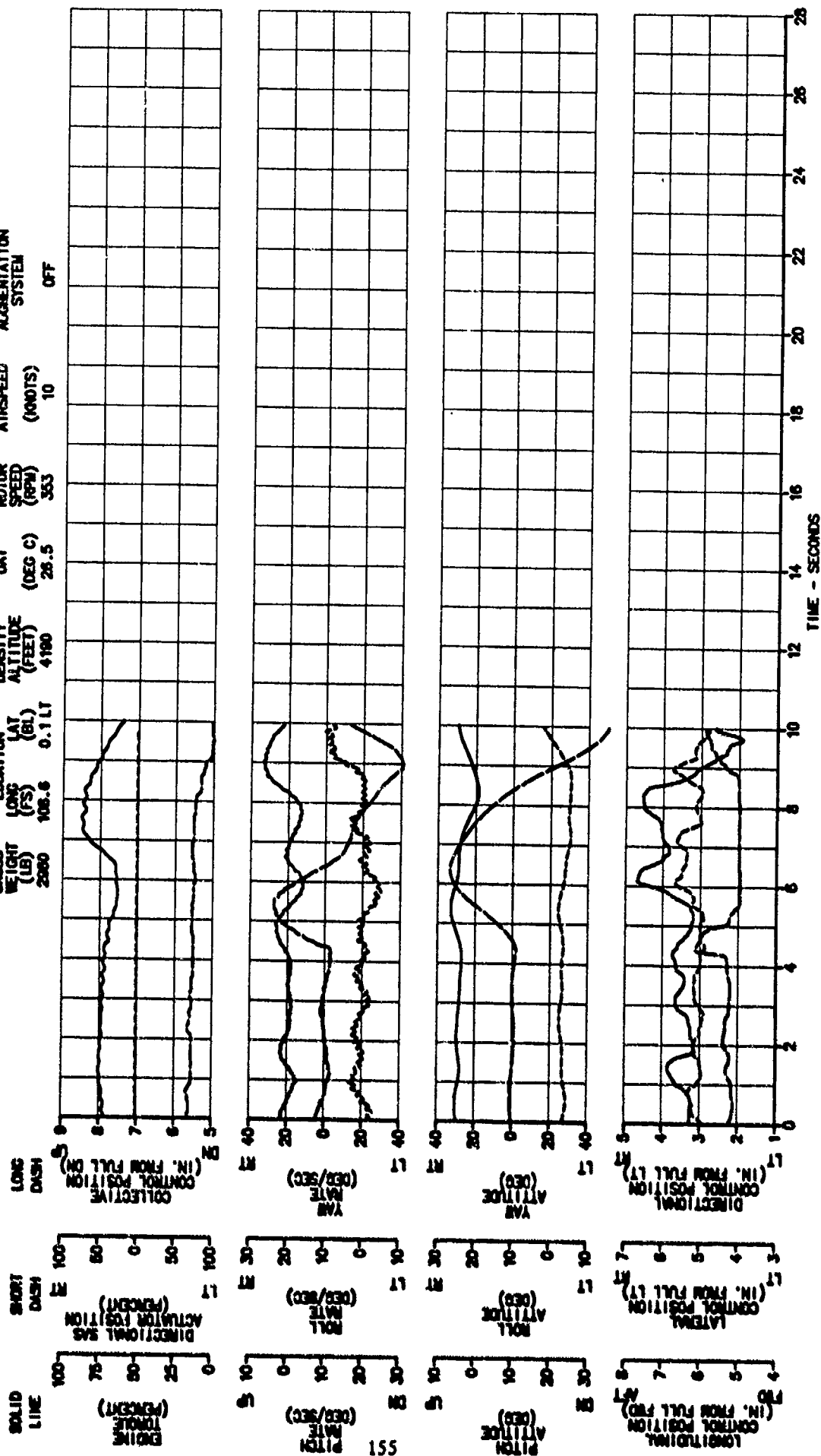


FIGURE E-120
LEFT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH

JON-00C USA S/N 70-15340
 TRUE AIRSPEED (KNOTS) 20
 STABILITY AUGMENTATION SYSTEM ON
 TRIM ROTOR SPEED (RPM) 354
 AVG DENSITY ALT (DEG C) 26.5
 AVG CS LOCATION LAT (DL) 0.117
 AVG CROSS WEIGHT (LB) 2850
 LONG (FS) 100.6

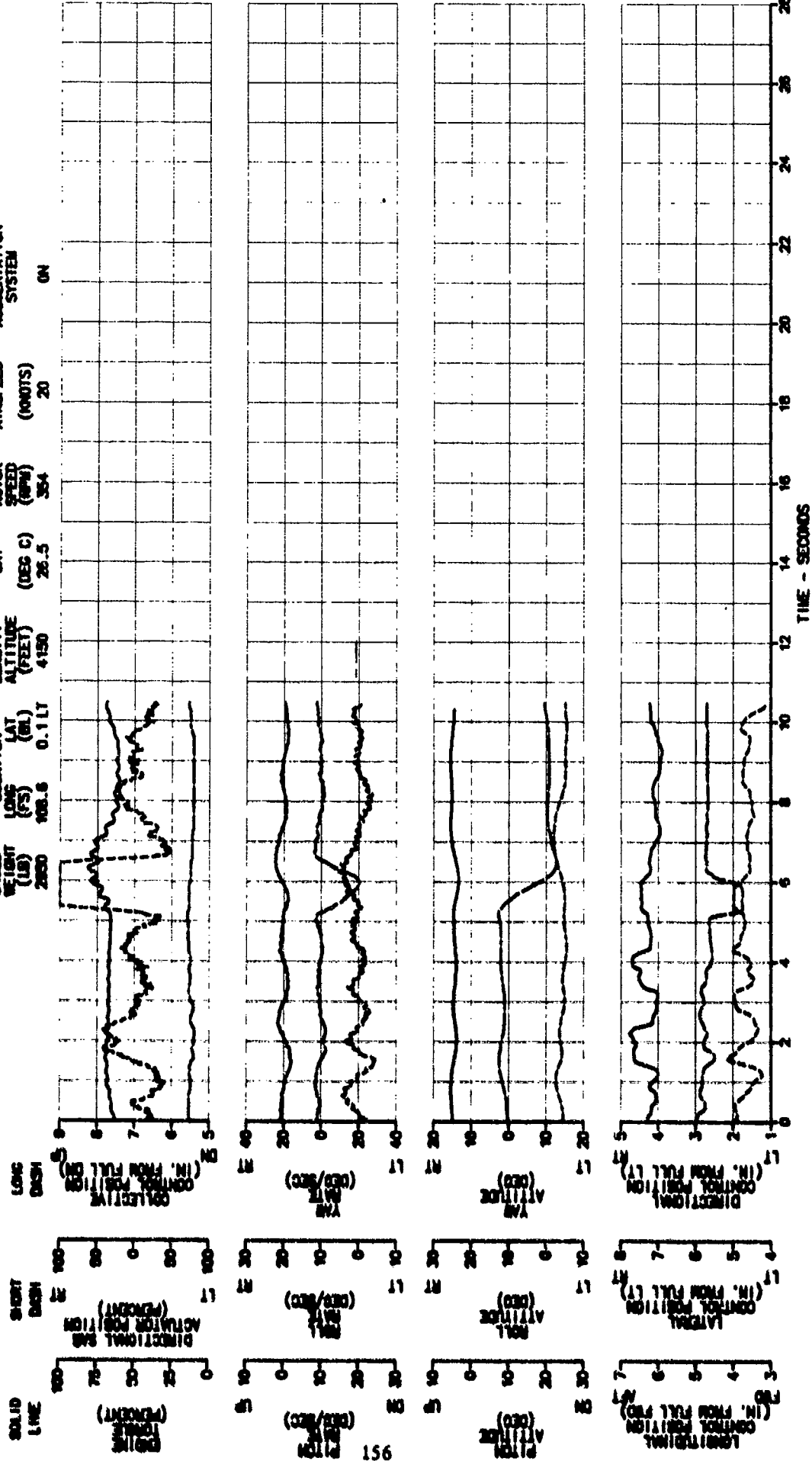


FIGURE E-121
LEFT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH

JDH-68C USA S/N 70-15349
 AVG GROSS WEIGHT (LB) 2000
 AVG CS LONG (FS) 108.1
 LAT (BL) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 4210
 AVG OAT (DEG C) 27.0
 TRIM MOTOR SPEED (RPM) 362
 TRUE AIRSPEED (KNOTS) 20
 STABILITY AUGMENTATION SYSTEM OFF

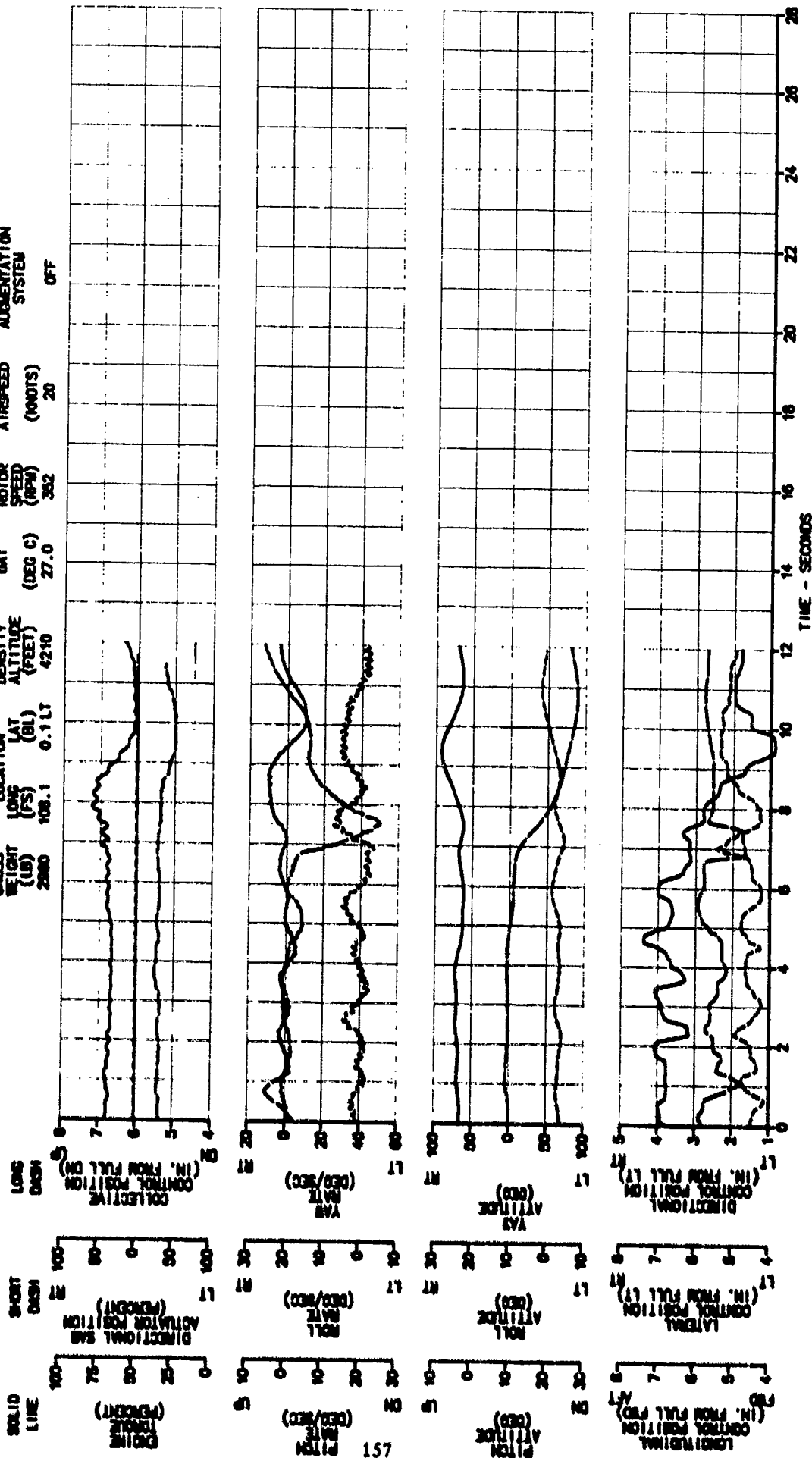
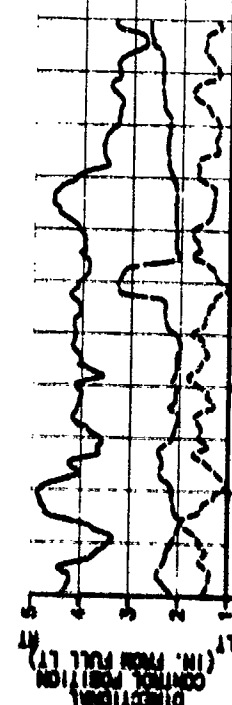
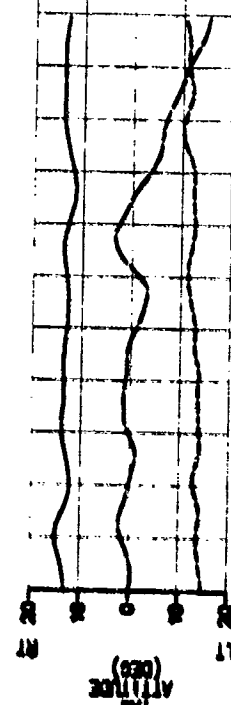
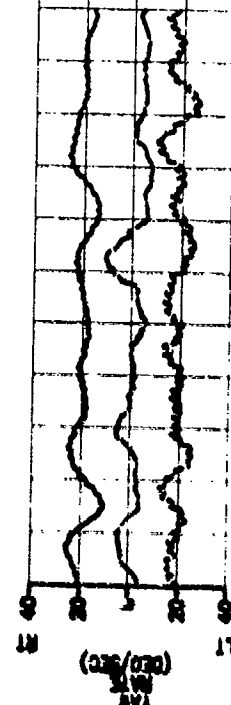
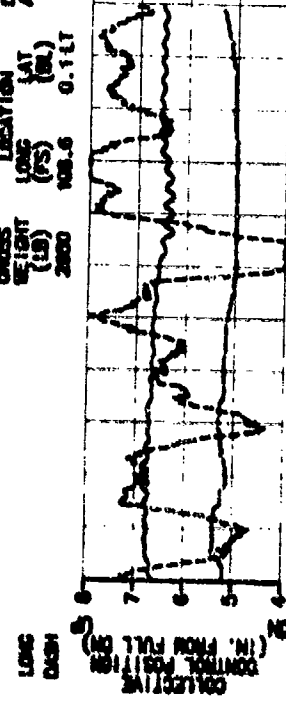
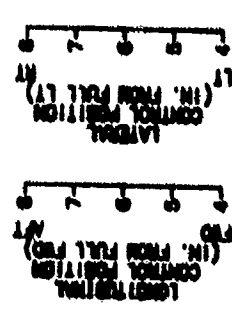
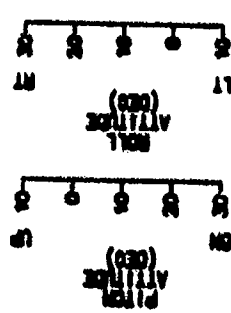
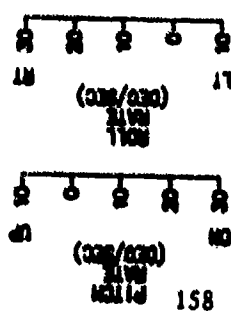
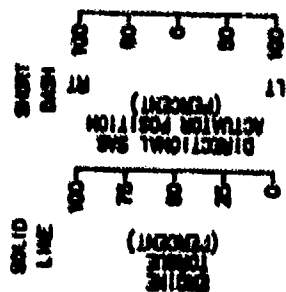


FIGURE E-122
RIGHT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH

JOH-88C USA S/N 70-15349
TRIM MOTOR SPEED (RPM) 352
TRUE AIRSPEED (KNOTS) 20
STABILITY AUGMENTATION SYSTEM ON
AVG CRGTS WEIGHT (LB) 2800
AVG CRGTS LOCATION LAT (DEG) 0.117
AVG CRGTS ALTITUDE (FEET) -4870
AVG CRGTS DENSITY (DEG C) 25.0



TIME - SECONDS

FIGURE E-123
 RIGHT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH
 J0H-50C USA S/N 70-15349
 STABILITY AUGMENTATION SYSTEM OFF

AVG GROSS WEIGHT (LB) 2200
 AVG LONG (FS) 108.1
 AVG LAT (BL) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 4130
 AVG OAT (DEG C) 28.5
 TRIM ROTOR SPEED (RPM) 360
 TRUE AIRSPEED (KNOTS) 20

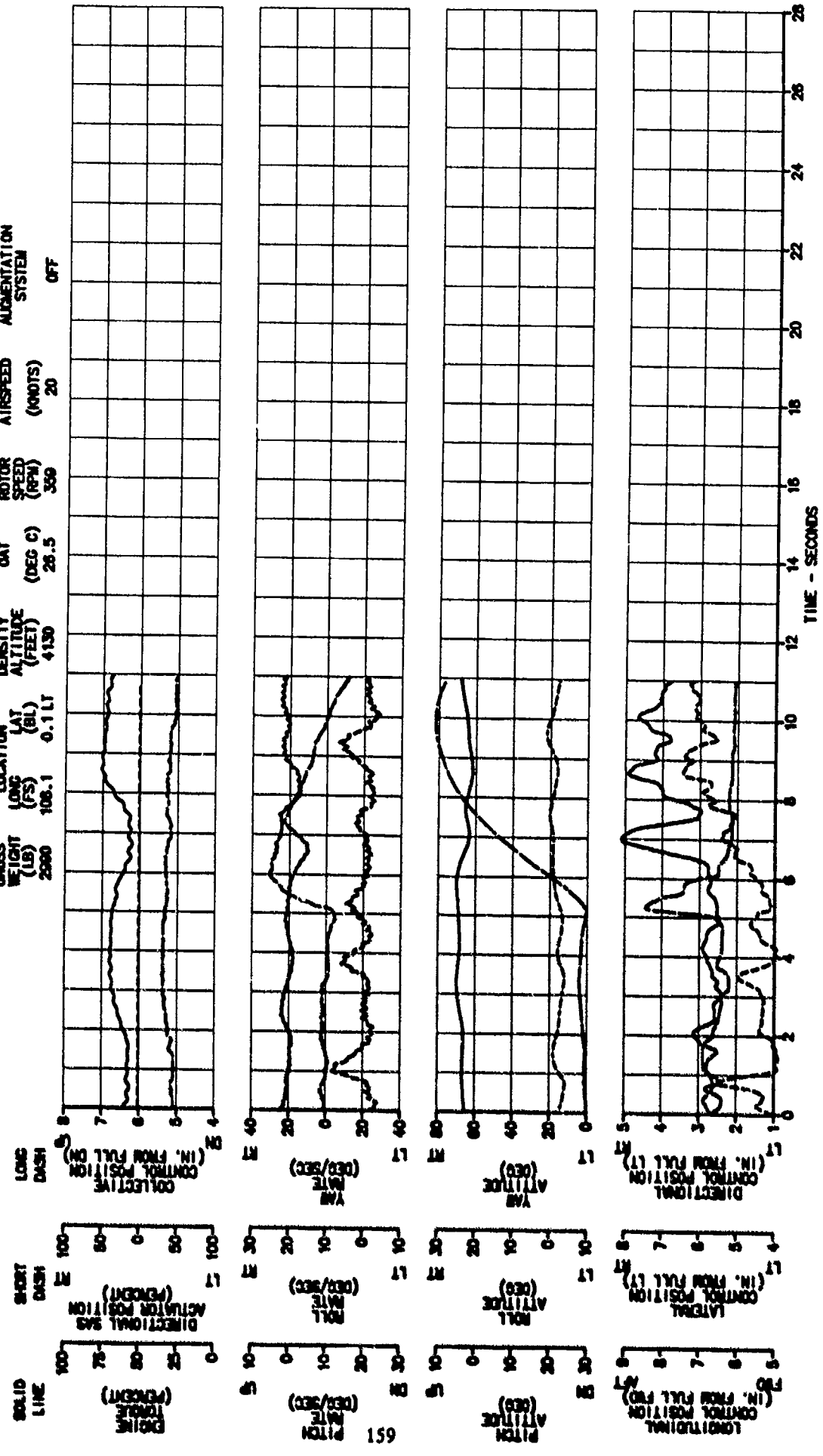
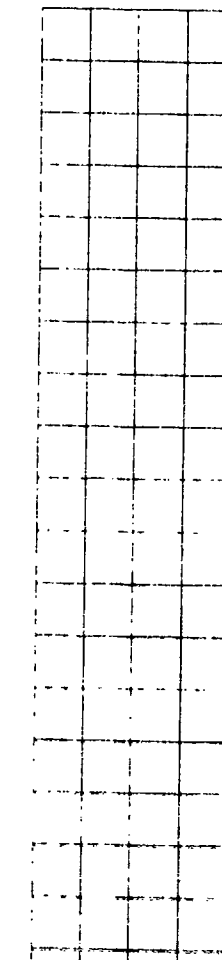
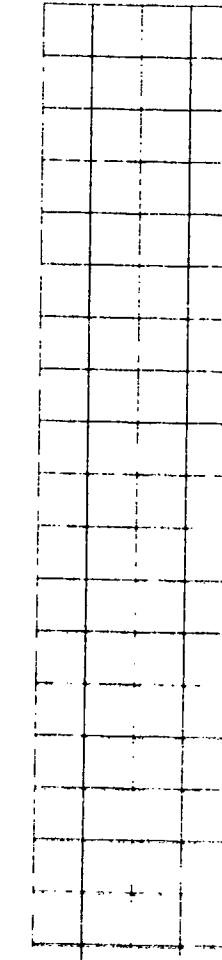
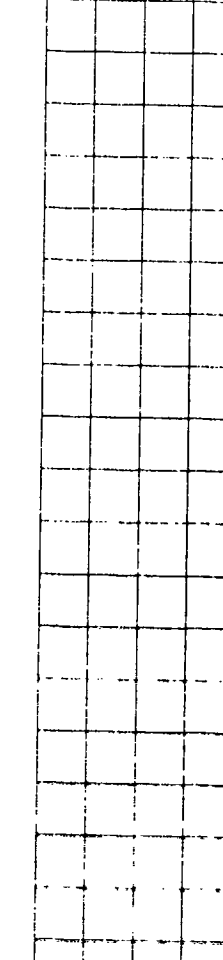
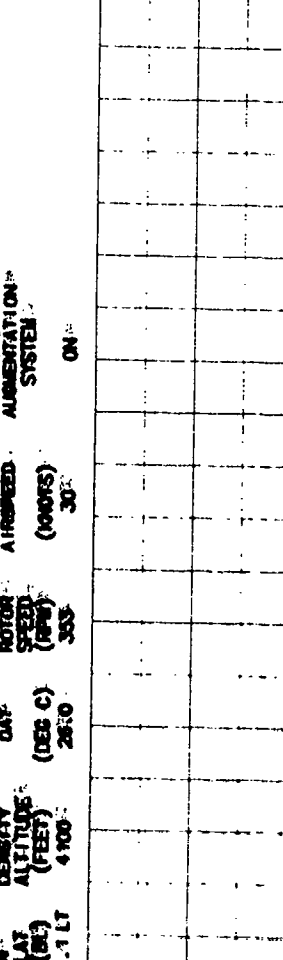
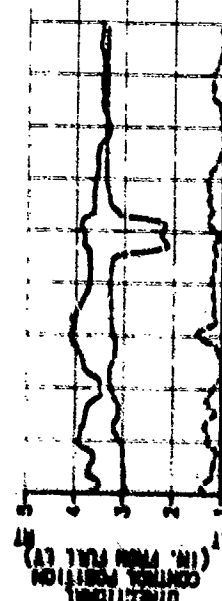
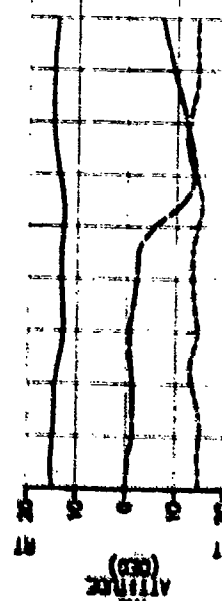
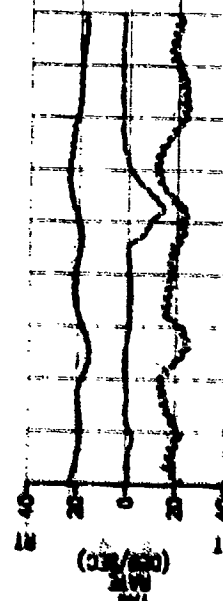
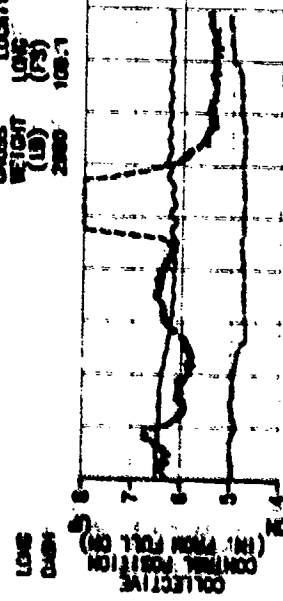
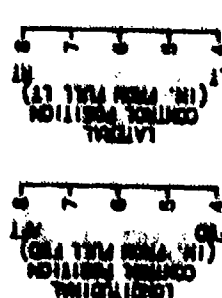
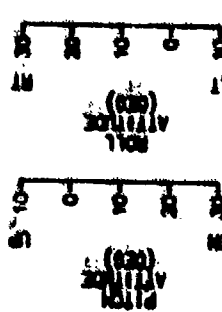
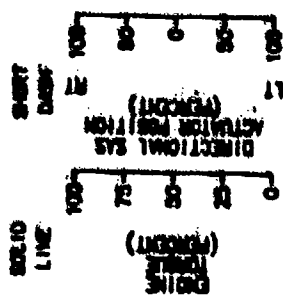


FIGURE E-124 LEFT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH

JOH-500-100-S/N 70-13340-1
 TRIM: TRUE AIRSPEED: 300 KNOTS
 ROTOR SPEED: 353 RPM
 AVE CS: 26.0 DEG C
 LOCATION: 108.1 0.1 LT
 DENSITY ALTITUDE: 4100 FEET
 AVE CROSS SECTION: 2000 (SQ)
 STABILITY AUGMENTATION SYSTEM: ON



TIME - SECONDS

FIGURE E-125
LEFT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH

ADP-58C USA S/N 70-15349

AVG. CRDS	AVG. CG	AVG. DENSITY	TRIM	TRUE	STABILITY
WEIGHT (LB)	LOCATION	ALTITUDE (FEET)	ROTOR SPEED (RPM)	AIR SPEED (KNOTS)	AUGMENTATION SYSTEM
2870	LONG (°S) 108.1	4130	355	30	OFF
	LAT (°N) 0.1 LT	(DEG C) 28.5			

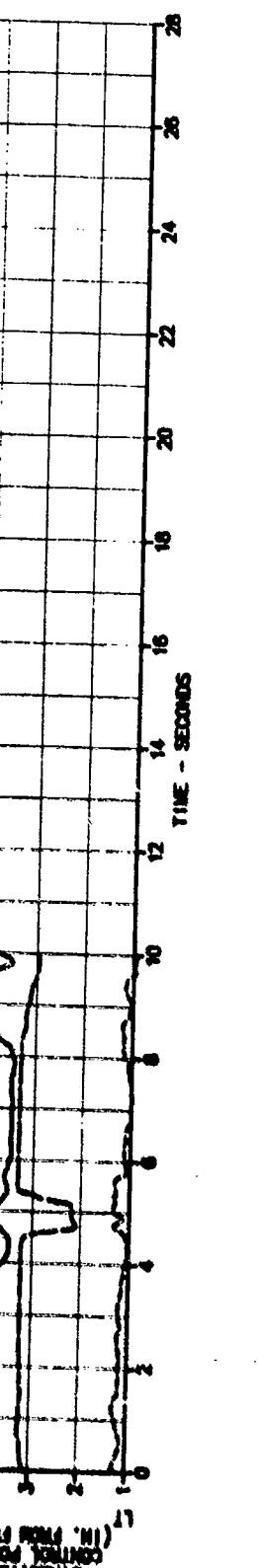
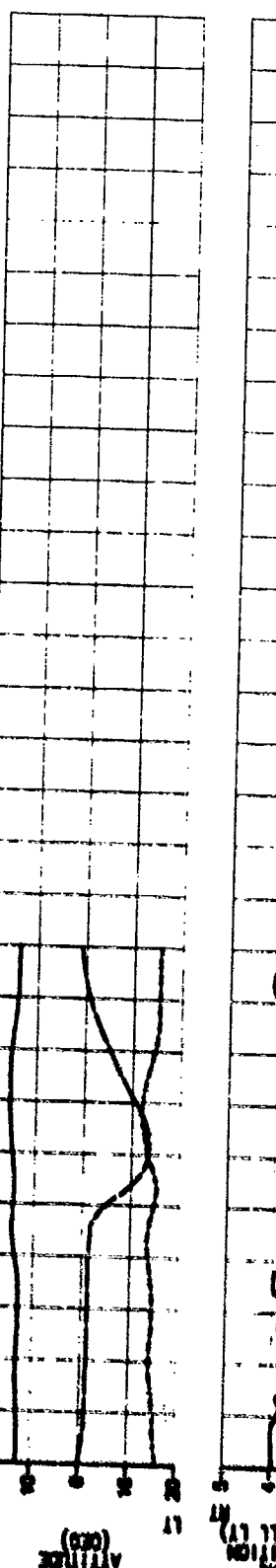
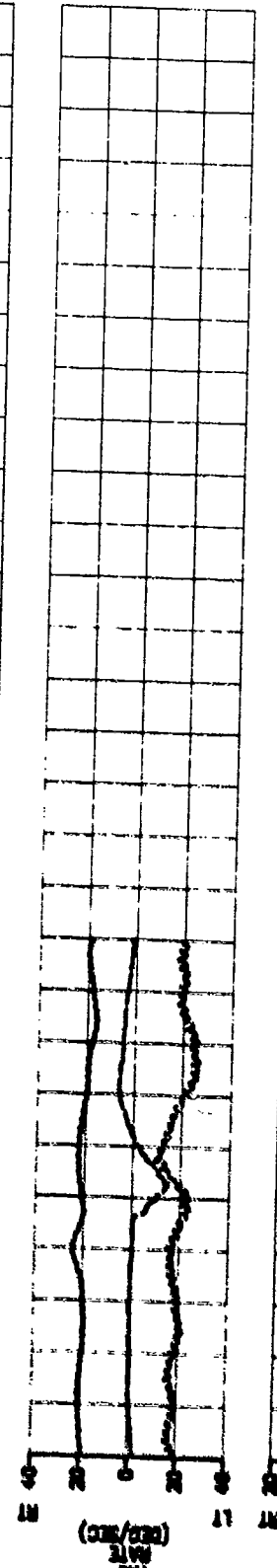
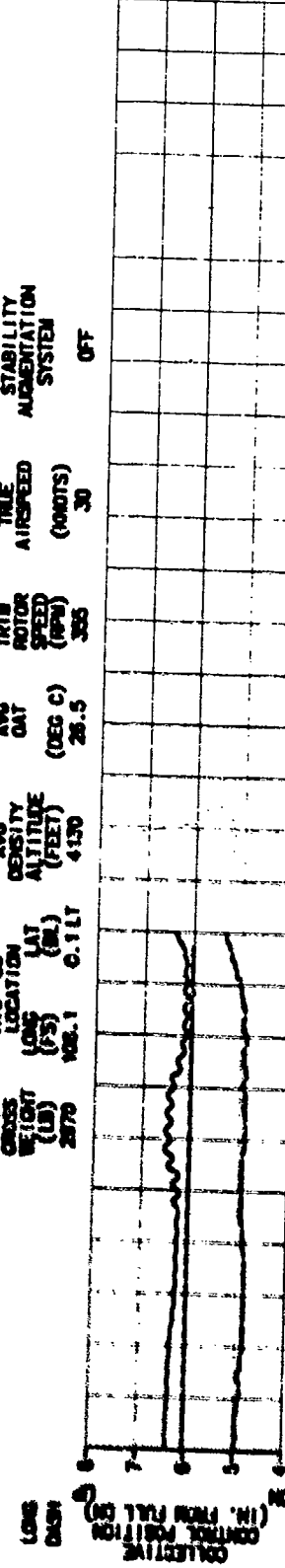
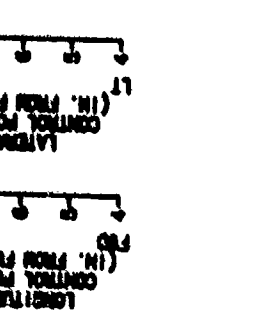
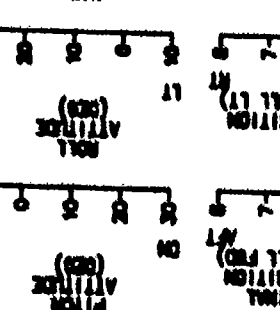
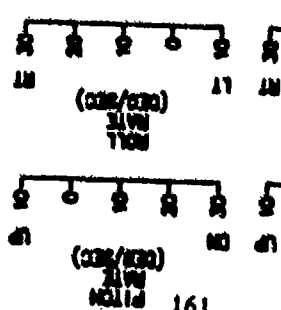
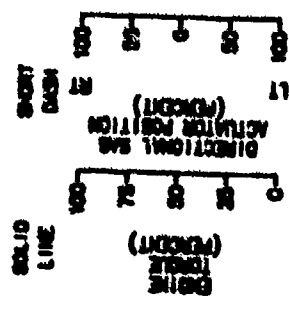
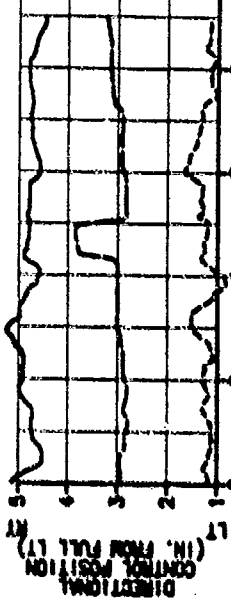
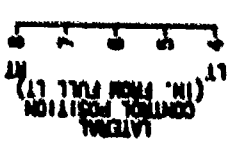
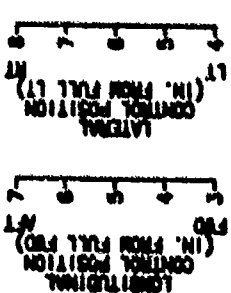
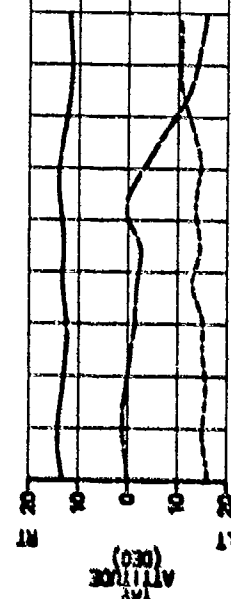
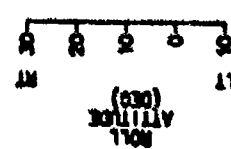
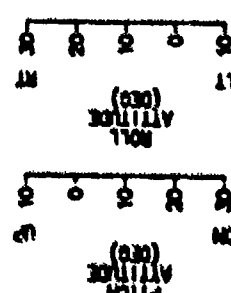
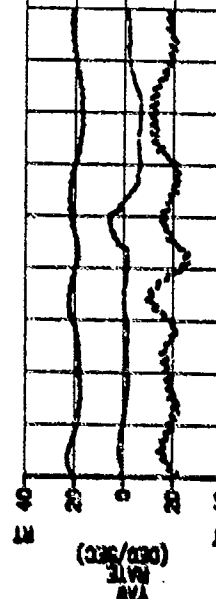
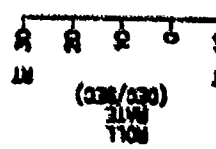
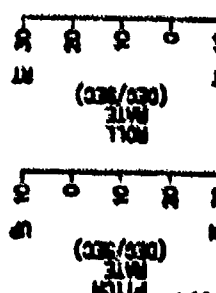
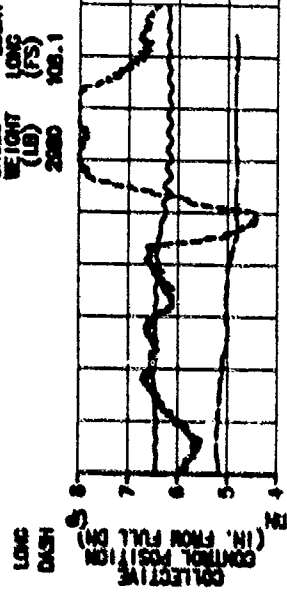
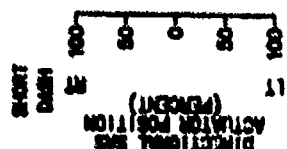
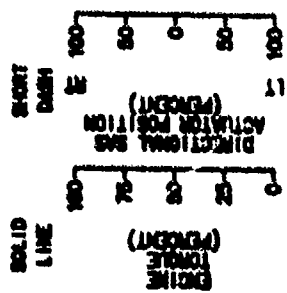


FIGURE E-126
RIGHT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH
JCH-50C LBA S/N 70-15349

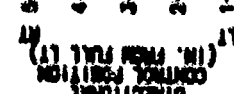
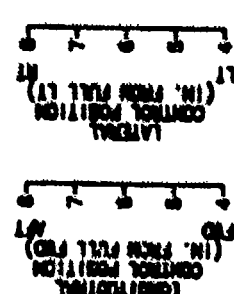
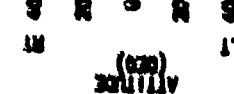
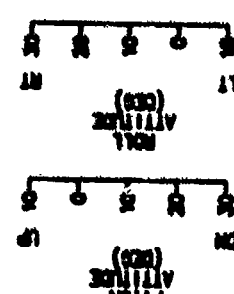
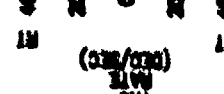
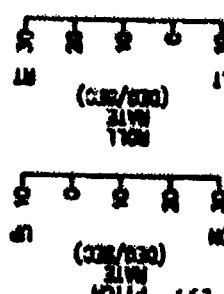
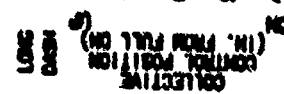
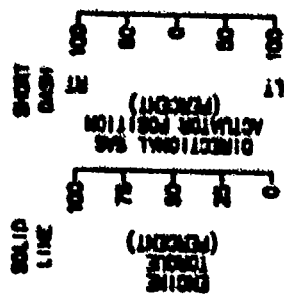
AVG CROSS WEIGHT 2080
AVG LONG 108.1
AVG CO LAT (BL) 0.1 LT
AVG DENSITY ALTITUDE (FEET) 4170
AVG DAT (DEG C) 28.0
TRIM ROTOR SPEED (RPM) 354
TRUE AIRSPEED (KNOTS) 30
STABILITY AUGMENTATION SYSTEM ON



TIME - SECONDS

FIGURE E-127
RIGHT DIRECTIONAL PULSE INPUT - 270 DEGREE AZIMUTH

JOM-50C USA S/N 70-15348
 AVG CROSS WEIGHT (LB) 2870
 AVG CS LONG (PS) 108.0
 LAT (DL) 0.1 LT
 AVG ALTITUDE (FEET) 4140
 AVG QAT (DEG C) 28.5
 TRIM MOTOR SPEED (RPM) 355
 TRUE AIRSPEED (KNOTS) 30
 STABILITY AUGMENTATION SYSTEM OFF



TIME - SECONDS

FIGURE E-129

DIRECTIONAL DOUBLET

JOM-58C USA S/N 70-15348

TRIM
CALIBRATED
AIRSPEED
(KNOTS) 80

TRIM
MOTOR
SPEED
(RPM) 354

AVG
GAT (DEG C) 19.5

AVG
LOCATION
LONG (°S) 107.8
LAT (°N) 0.117

AVG
CROSS
WEIGHT
(LB) 2000

AVG
DENSITY
ALTITUDE
(FEET) 8820

STABILITY
AUGMENTATION
SYSTEM OFF

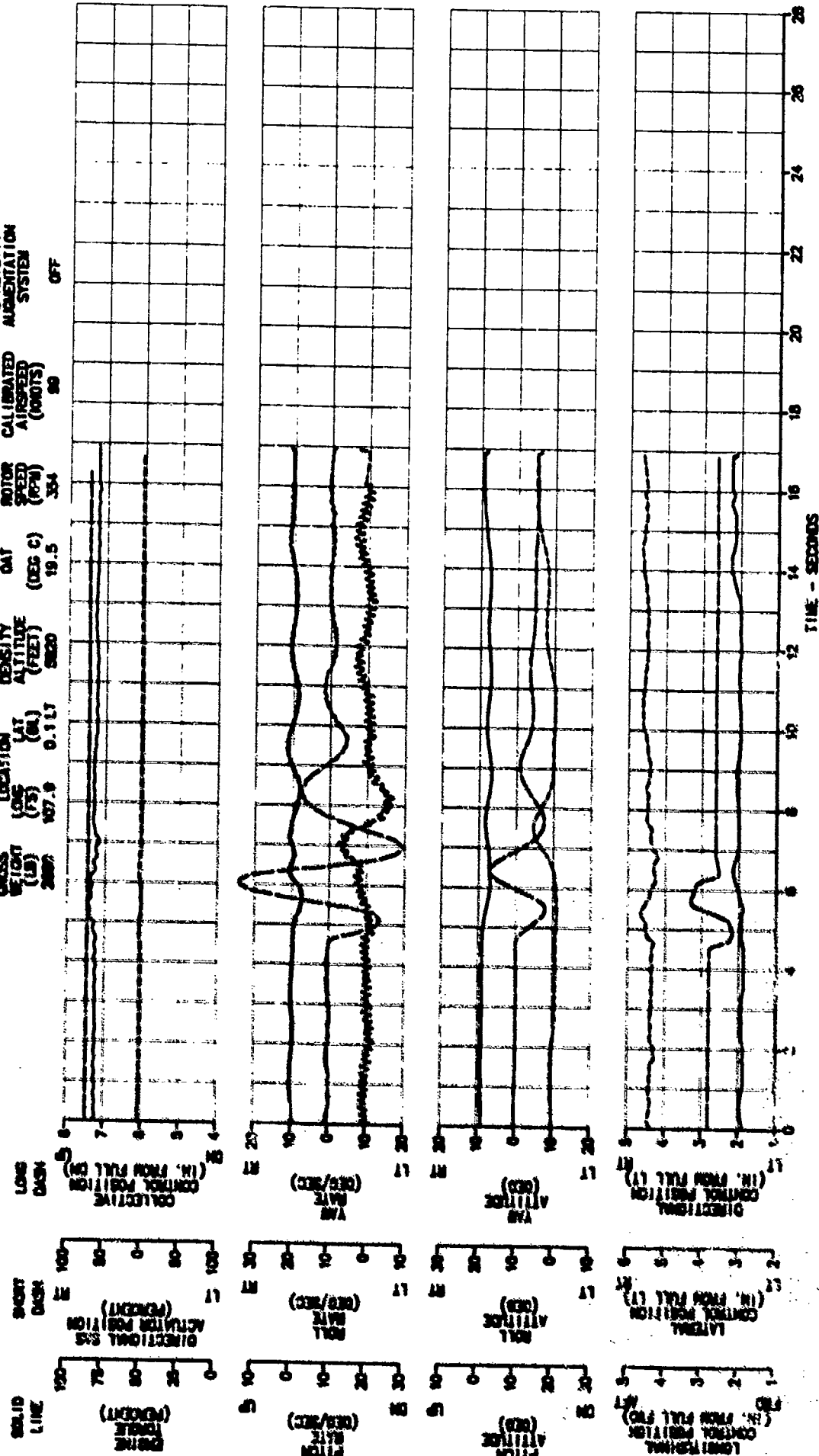


FIGURE E-130
DIRECTIONAL DOUBLET
J04-58C USA S/N 70-15349

TRIM
CALIBRATED
AIRSPEED
(KNOTS) 64

TRIM
ROTOR
SPEED
(RPM) 354

AVG
OAT
(DEG C) 18.0

AVG
DENSITY
ALTITUDE
(FEET) 5970

AVG CS
LOCATION
(FS) 103.2

AVG CS
LAT
(BL) 0.1 LT

AVG
GROSS
WEIGHT
(LB) 2980

AVG CS
LONG
(FS) 103.2

AVG CS
LAT
(BL) 0.1 LT

AVG CS
LONG
(FS) 103.2

AVG CS
LAT
(BL) 0.1 LT

AVG CS
LONG
(FS) 103.2

AVG CS
LAT
(BL) 0.1 LT

AVG CS
LONG
(FS) 103.2

AVG CS
LAT
(BL) 0.1 LT

AVG CS
LONG
(FS) 103.2

AVG CS
LAT
(BL) 0.1 LT

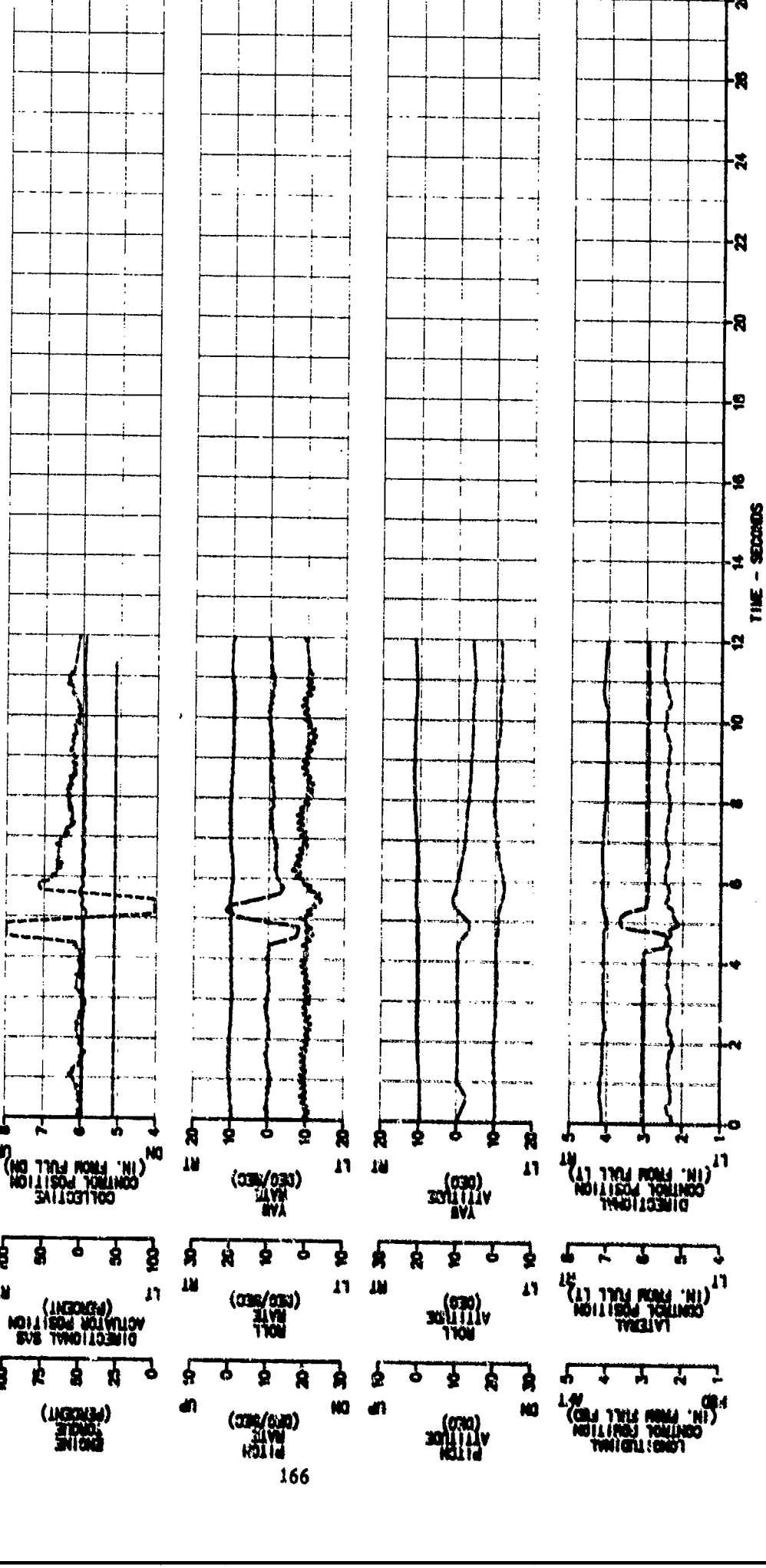


FIGURE E-131
DIRECTIONAL DOUBLET
JDN-58C USA S/M 70-15349

AVG GROSS WEIGHT (LB) 28040
AVG CS LOCATION (LONG (FS) 108.0 LAT (ML) 0.1 LT
AVG DENSITY ALTITUDE (FEET) 5860
AVG OAT (DEG C) 18.5
TRIM MOTOR SPEED (RPM) 354
TRIM CALIBRATED AIRSPEED (KNOTS) 62
STABILITY AUGMENTATION SYSTEM OFF

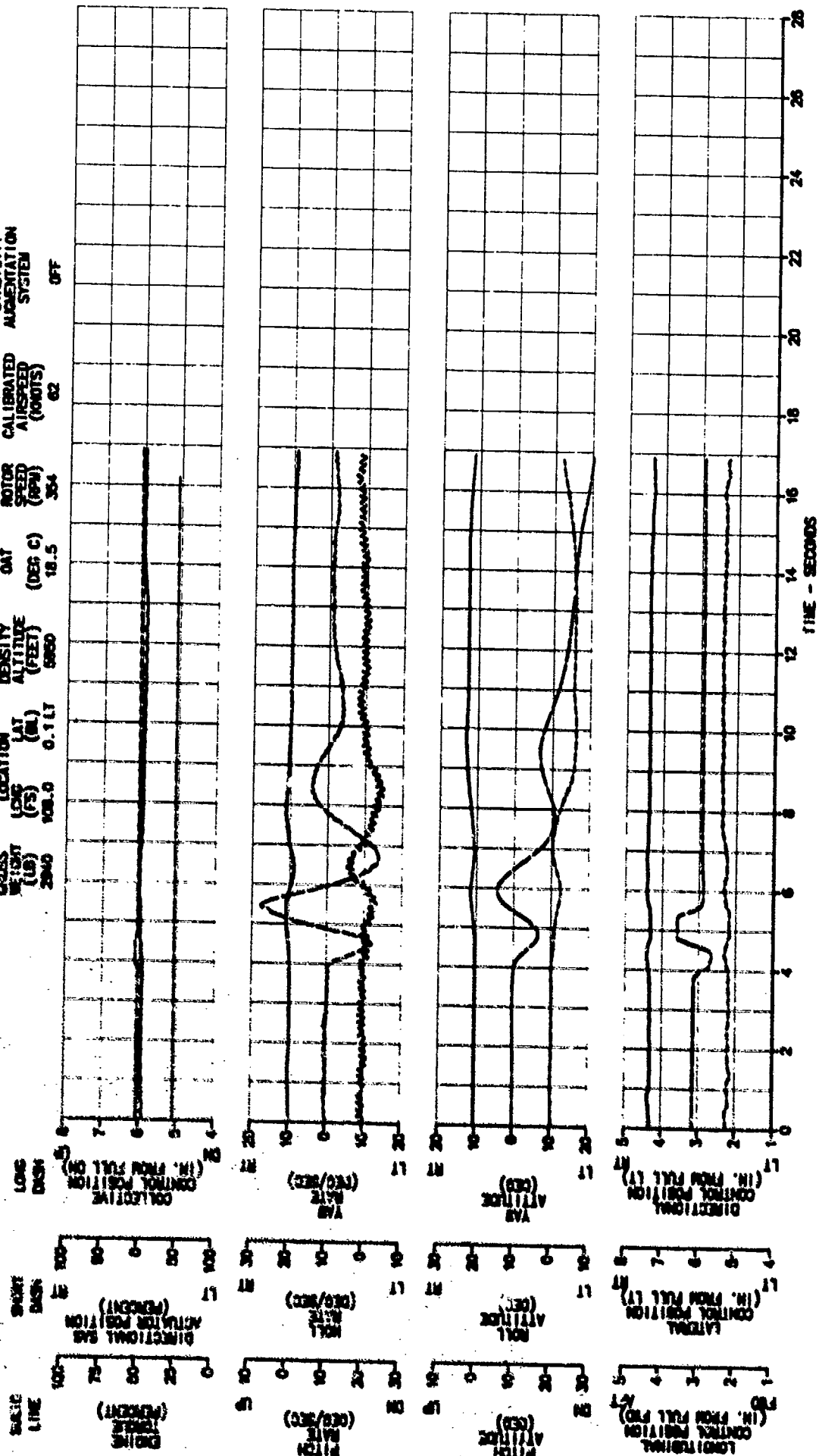


FIGURE E-132
RELEASE FROM LEFT SIDESLIP

JOM-ORC USA S/N 70-15348
 AVG CROSS WEIGHT (LB) 2870
 AVG CS LONG (FT) 107.9
 AVG CS LAT (IN) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 19.0
 AVG OAT (DEG C)
 TRIM CALIBRATED AIRSPEED (KNOTS) 90
 TRIM MOTOR SPEED (RPM) 354
 STABILITY AUGMENTATION SYSTEM ON

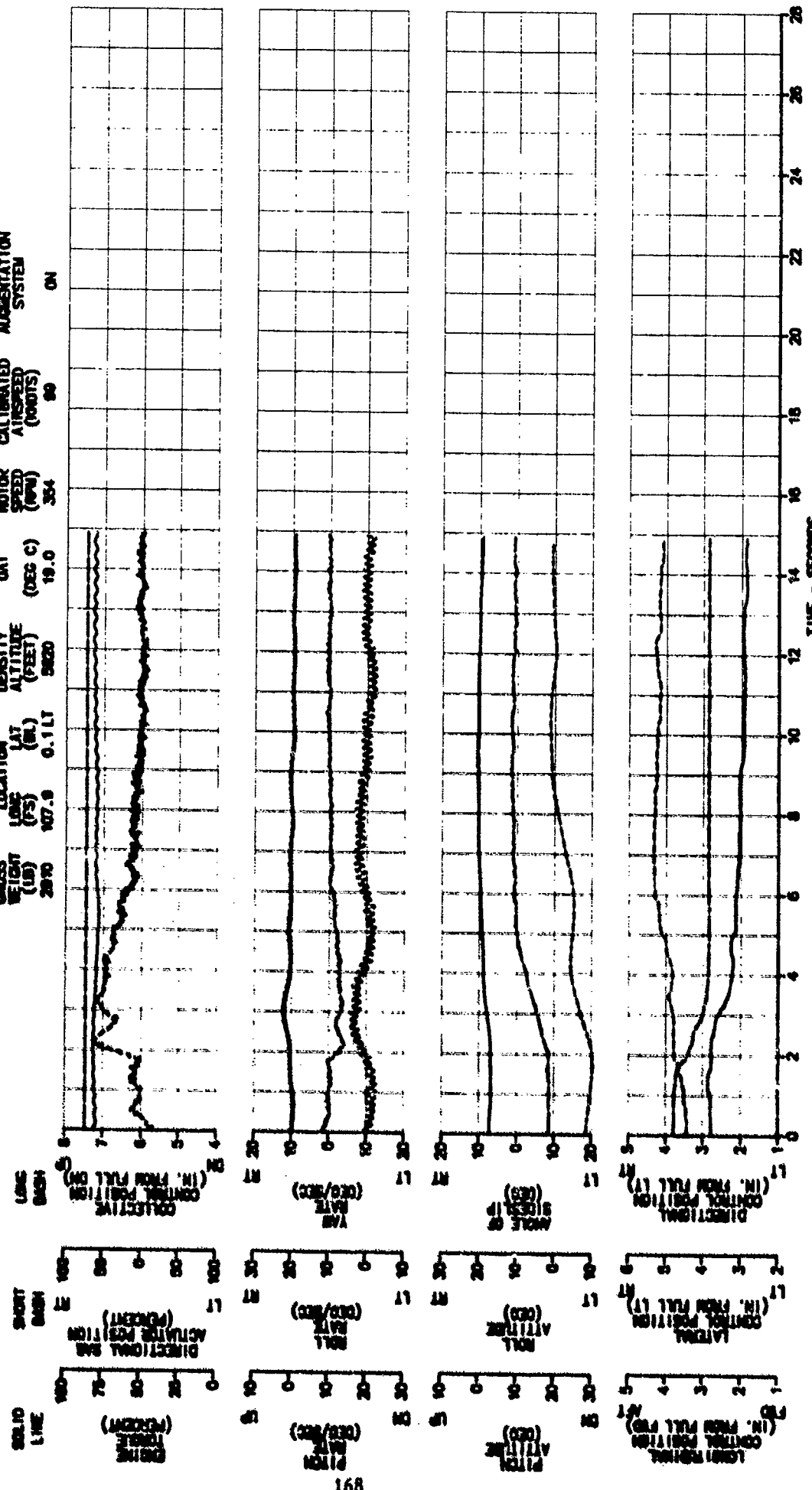


FIGURE E-133
RELEASE FROM LEFT SIDESLIP

JOH-58C USA S/N 70-15349
 TRIM CALIBRATED AIRSPEED (KNOTS) 90
 TRIM ROTOR SPEED (RPM) 354
 STABILITY AUGMENTATION SYSTEM OFF
 AVG CROSS WEIGHT (LB) 2870
 AVG CS LOCATION
 LONG (°S) 107.8
 LAT (°N) 0.11
 AVG DENSITY ALT (DEG C) 18.5
 AVG ALTITUDE (FEET) 8850

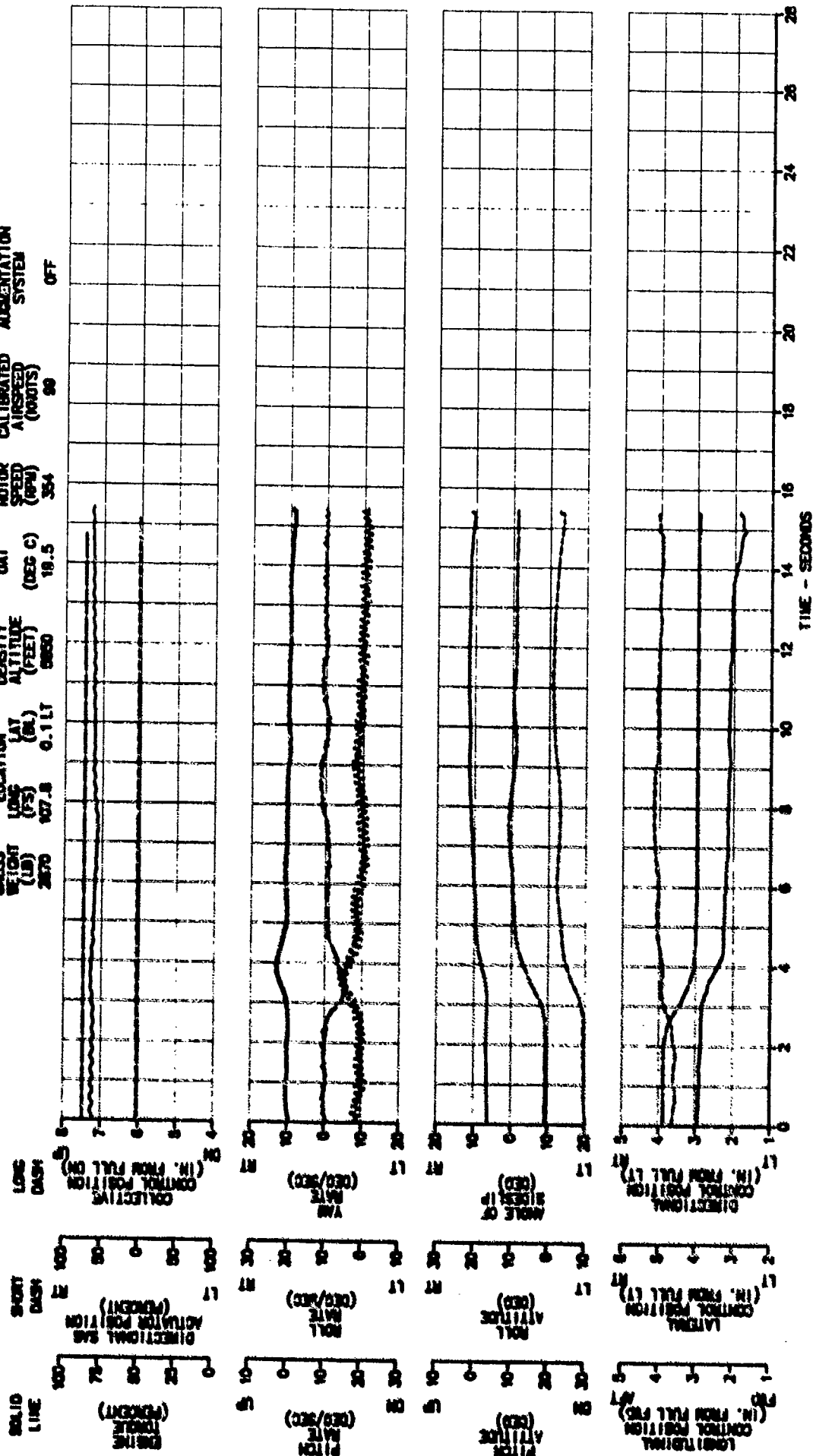


FIGURE E-134
RELEASE FROM RIGHT SIDESLIP

JAN-GMC USA S/N 70-15340
AVG DENSITY ALT (FEET) 2810
AVG ALT (FEET) 107.9
AVG CG LAT (IN) 0.1 LT
AVG CG LONG (IN) 2810
AVG DENSITY ALT (FEET) 2810
AVG ALT (FEET) 107.9
AVG CG LAT (IN) 0.1 LT
AVG CG LONG (IN) 2810
TRIM CALIBRATED AIRSPEED (KNOTS) 354
TRIM MOTOR SPEED (RPM) 19.5
STABILITY AUGMENTATION SYSTEM ON

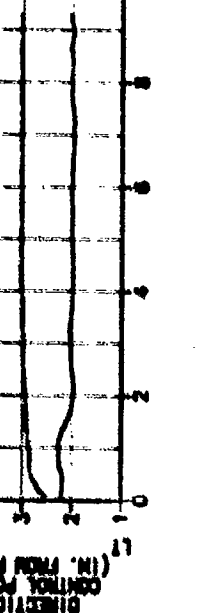
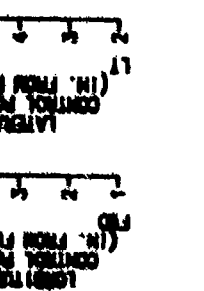
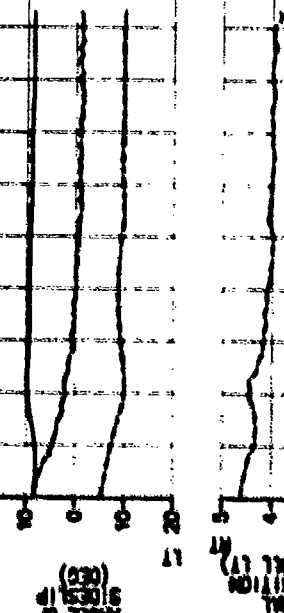
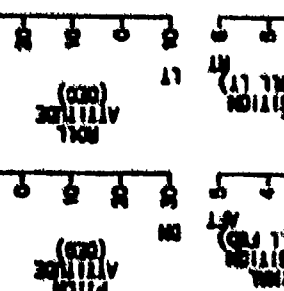
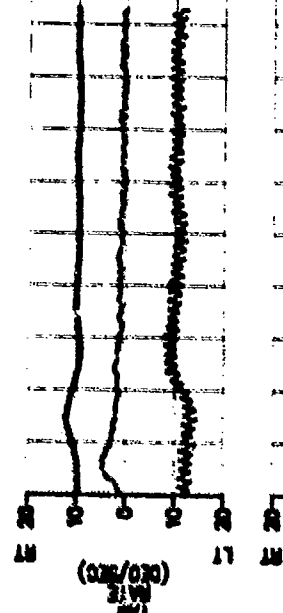
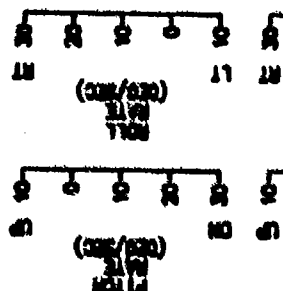
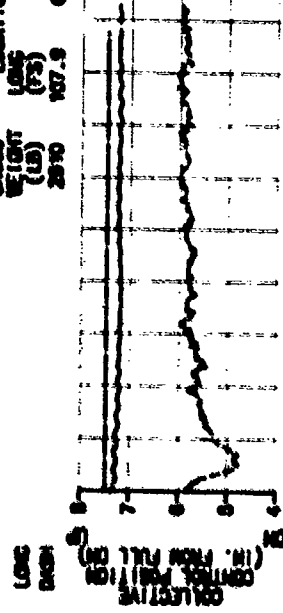
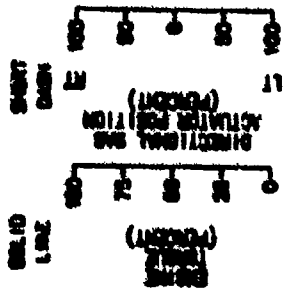


FIGURE E-135
RELEASE FROM RIGHT SIDESLIP

JOH-56C USA S/N 70-15349
AVG GROSS WEIGHT (LB) 2870
AVG CS LONG (FS) 107.8
AVG CS LAT (ML) 0.1 LT
AVG DENSITY ALTITUDE (FEET) 5020
AVG OAT (DEG C) 19.0
TRIM ROTOR SPEED (RPM) 354
TRIM CALIBRATED AIRSPEED (KNOTS) 90
STABILITY AUGMENTATION SYSTEM OFF

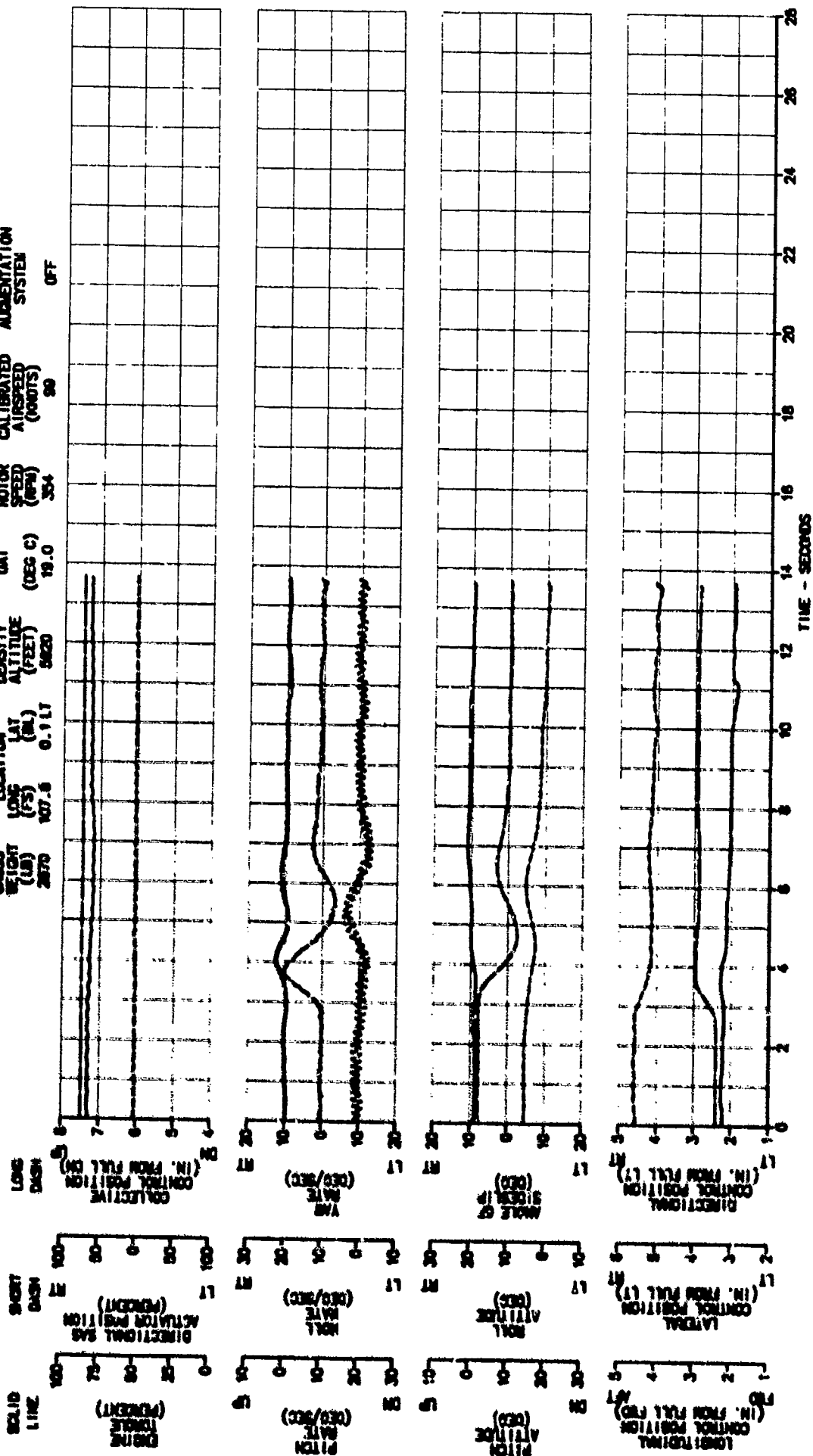


FIGURE E-136
RELEASE FROM LEFT SIDESLIP

JOM-00C USA S/N 70-15348
AVG CROSS WEIGHT (LB) 2000
AVG CG LONG (F3) 108.2
AVG CG LAT (BL) 0.1 LT
AVG DENSITY ALT (DEG C) 19.0
TRIM MOTOR SPEED (RPM) 354
TRIM CALIBRATED AIRSPEED (KNOTS) 64
STABILITY AUGMENTATION SYSTEM ON

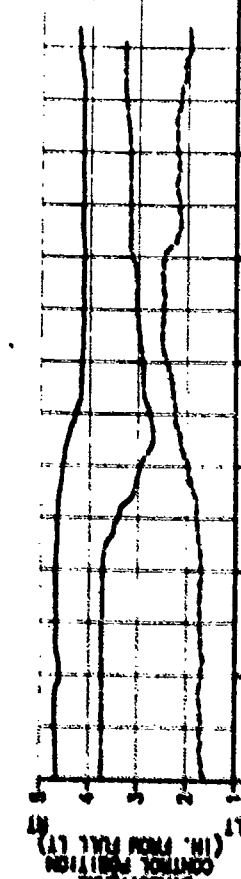
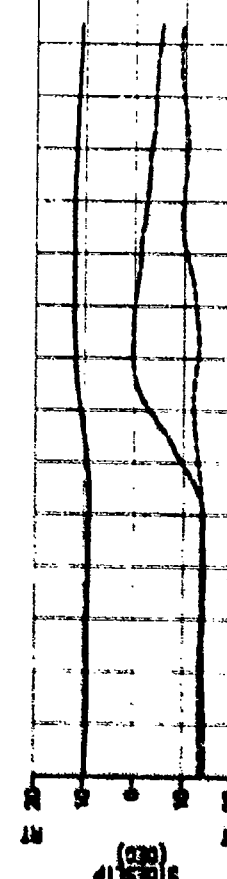
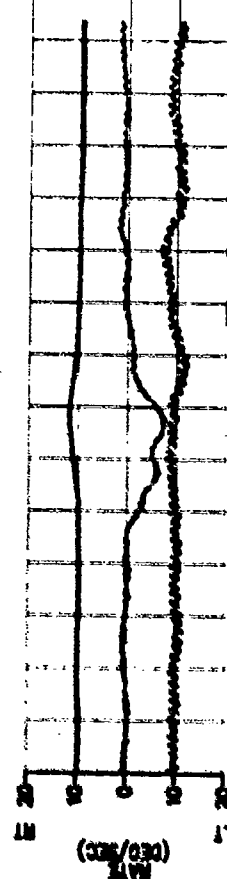
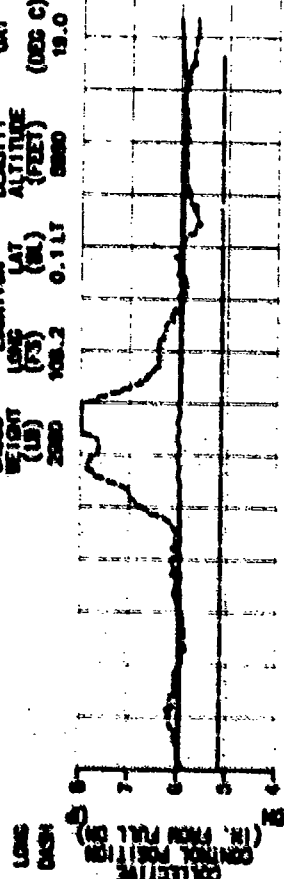
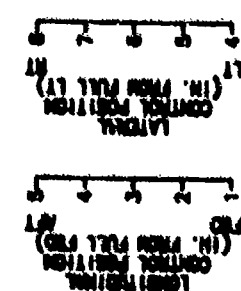
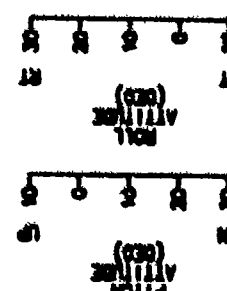
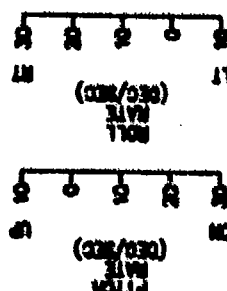
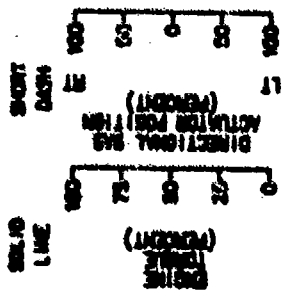


FIGURE E-157
RELEASE FROM LEFT SIDESLIP

JOHN-SBEC USA S/N 70-15349

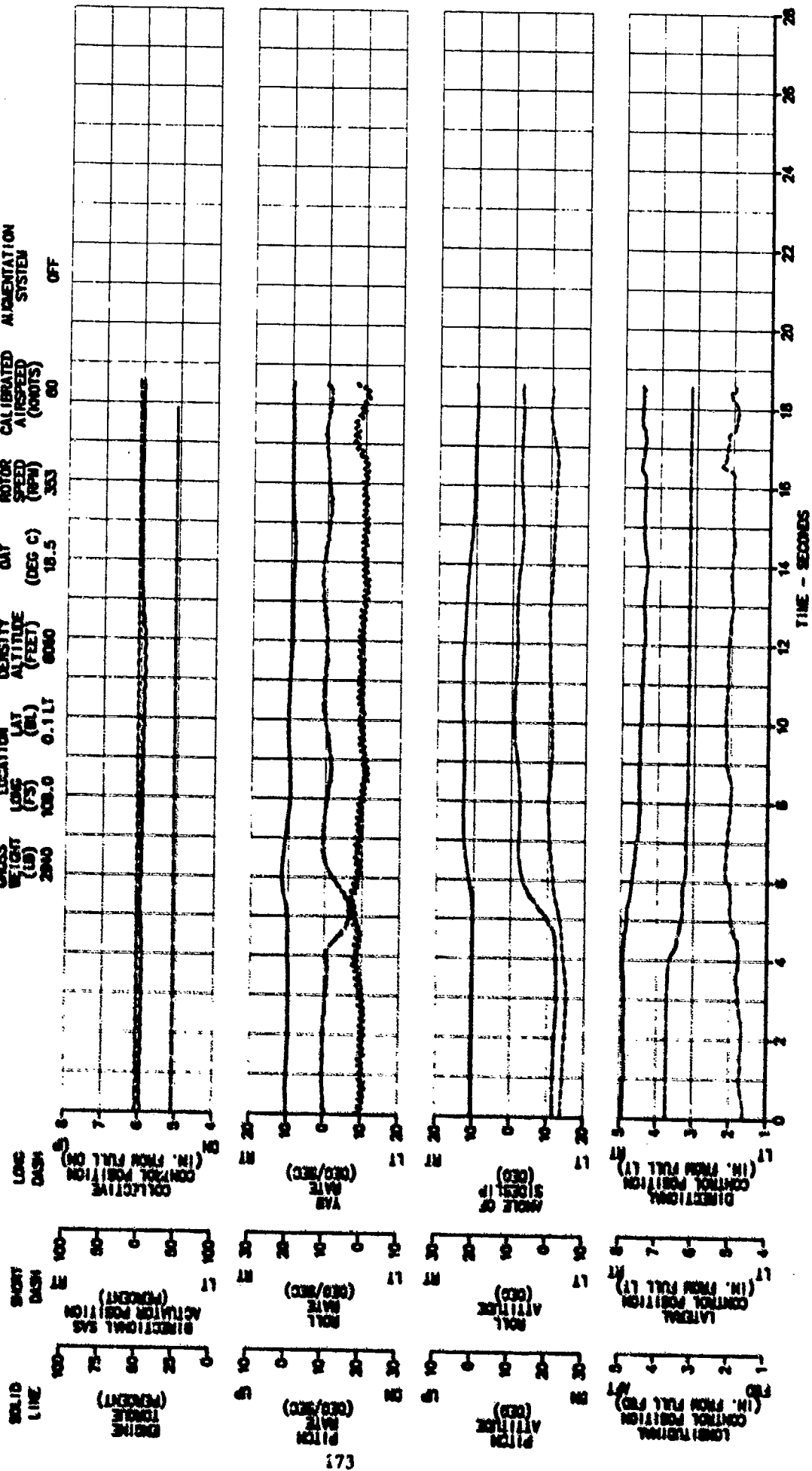
[illegible]

FIGURE E-138
RELEASE FROM RIGHT SIDESLIP

JRM-SEC USA S/N 70-15346

AVG CROSS WEIGHT (LB) 2000
AVG CS LOCATION LONG (FT) 108.2 LAT (ML) 0.117
AVG DENSITY ALTITUDE (FEET) 5870
AVG QAT (DEG C) 19.0
TRIM ROTOR SPEED (RPM) 354
TRIM CALIBRATED AIRSPEED (KNOTS) 65
STABILITY AUGMENTATION SYSTEM ON

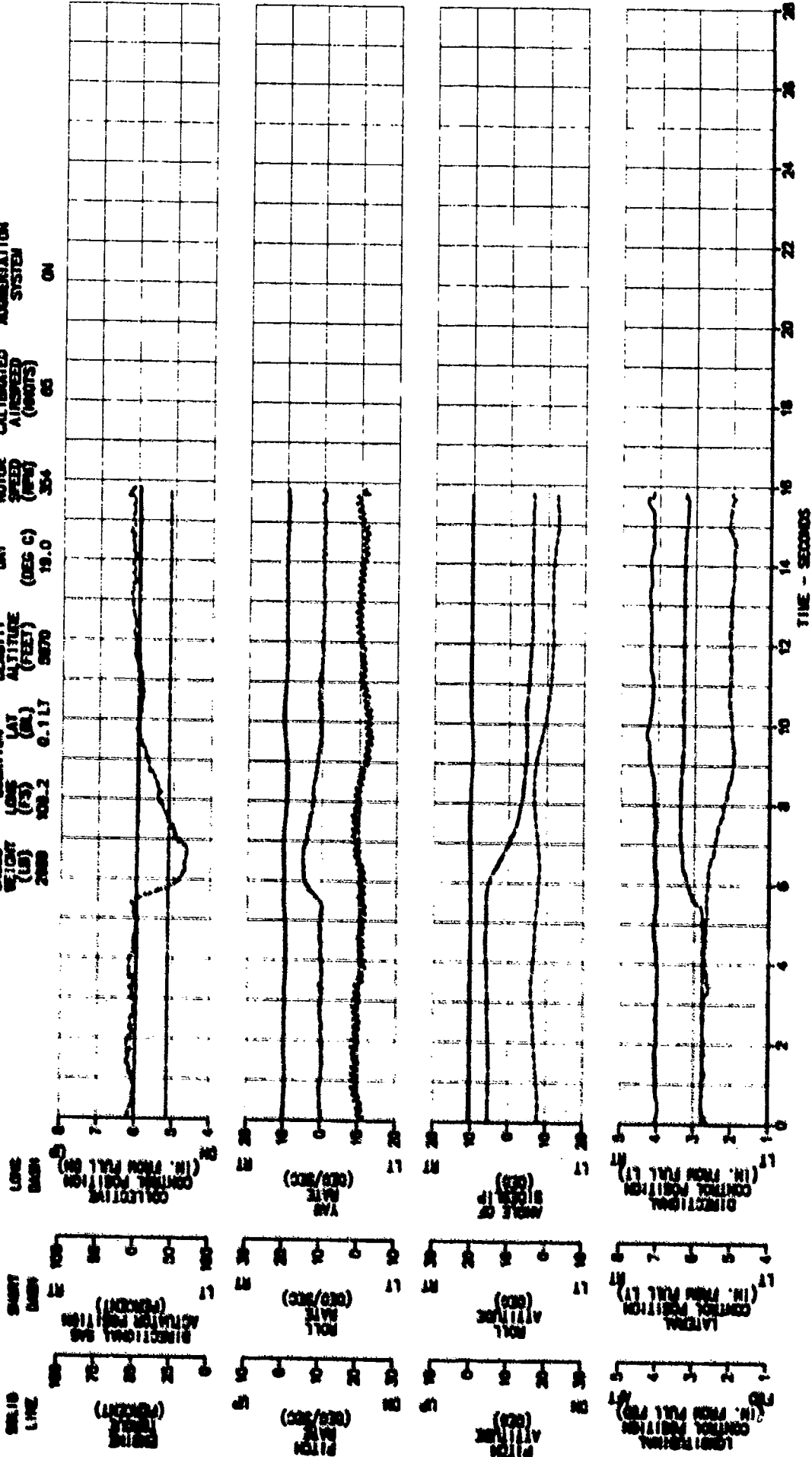


FIGURE E-139
RELEASE FROM RIGHT SIDESLIP

J01-50C USA S/N 70-15349
AVG CROSS WEIGHT (LB) 2840
AVG CC LOCATION (IN) 108.0
LAT (ML) 0.1 LT
AVG DENSITY (G/CC) 19.5
AVG ALTITUDE (FEET) 6100
TRIM MOTOR SPEED (RPM) 354
TRIM CALIBRATED AIRSPEED (KNOTS) 62
STABILITY AUGMENTATION SYSTEM OFF

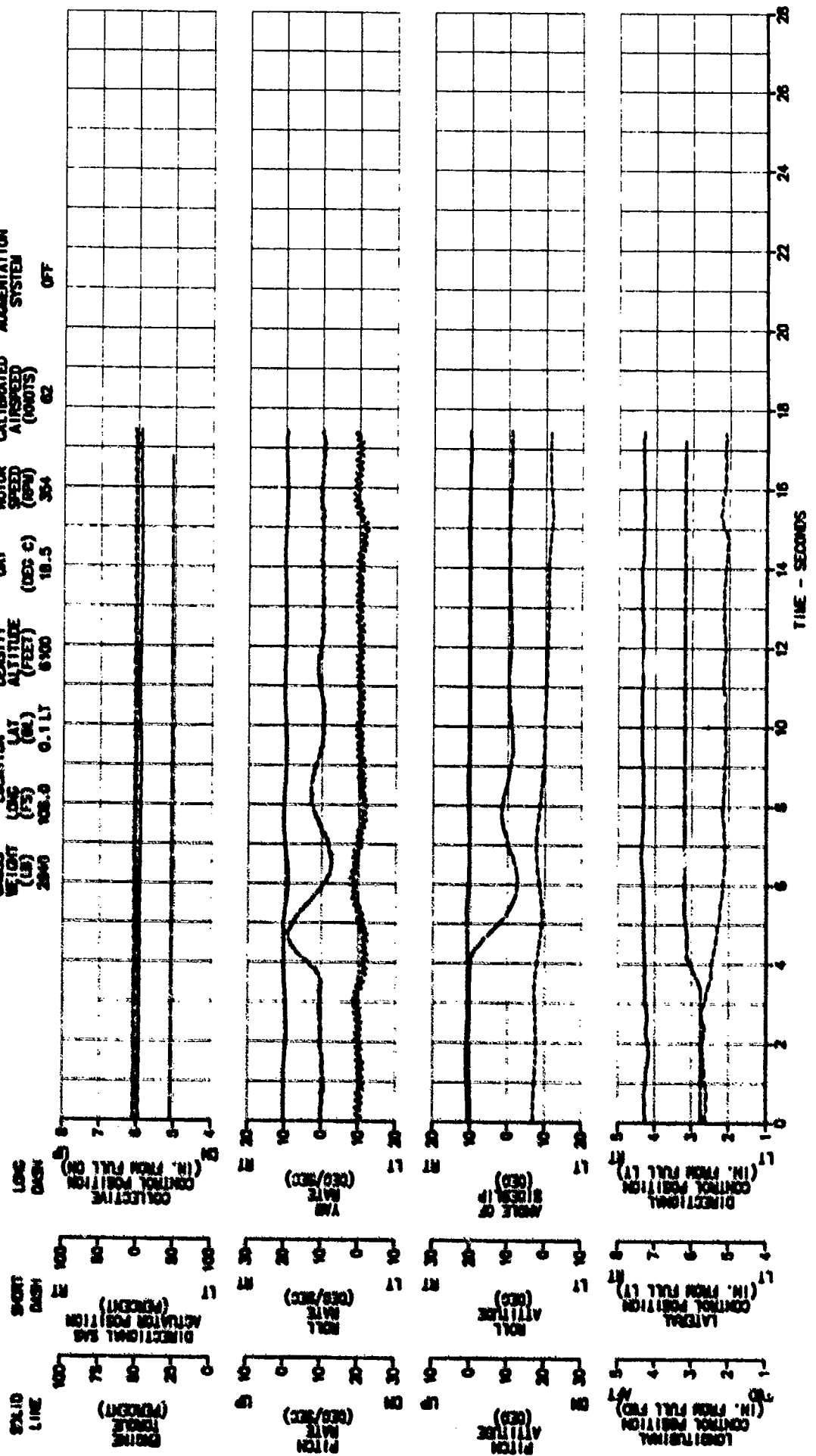


FIGURE E-140
SPIRAL STABILITY
J64-58C USA S/N 70-15340

AVG GROSS WEIGHT (LB) 2870
AVG CG LOCATION LONG (FT) 38.1 LAT (IN.) 0.1 LT
AVG DENSITY ALTITUDE (FEET) 5870
AVG OAT (DEG C) 19.5
TRIM MOTOR SPEED (RPM) 304
CALIBRATED AIRSPEED (KNOTS) 63
STABILITY AUGMENTATION SYSTEM ON

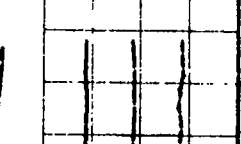
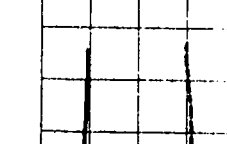
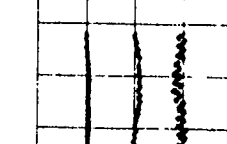
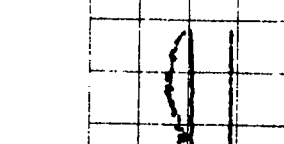
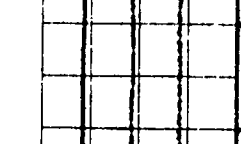
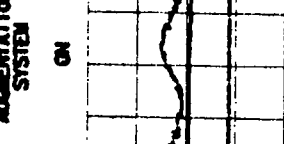
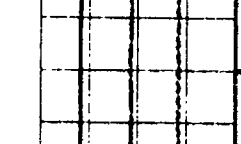
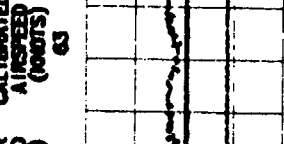
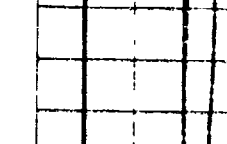
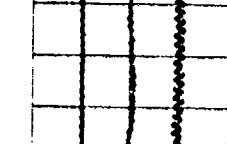
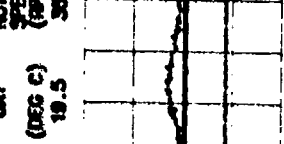
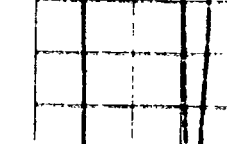
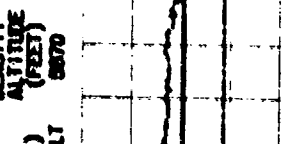
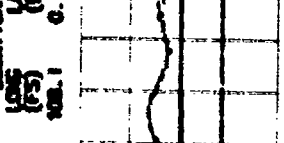
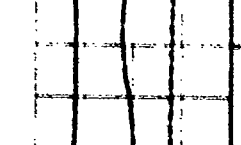
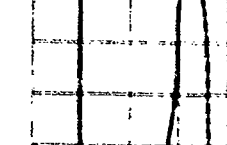
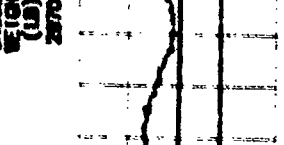
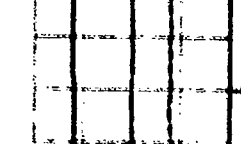
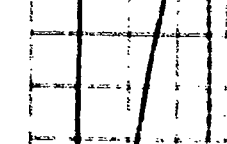
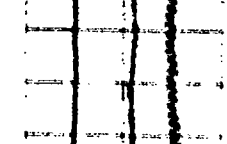
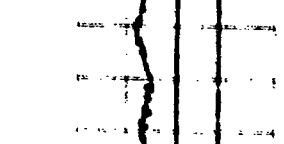
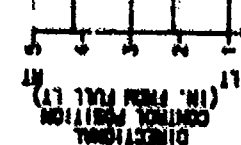
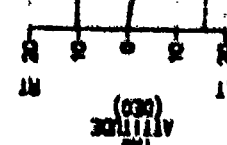
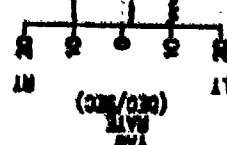
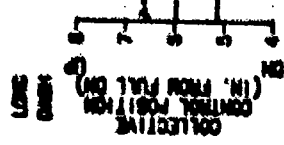
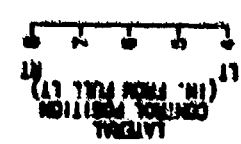
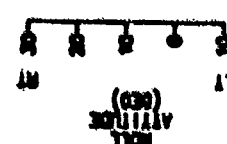
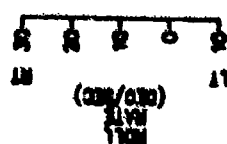
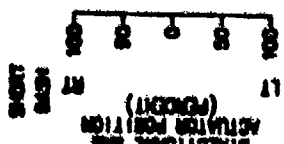
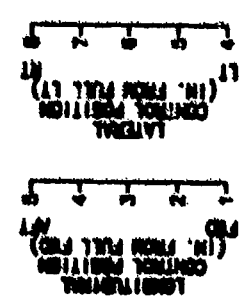
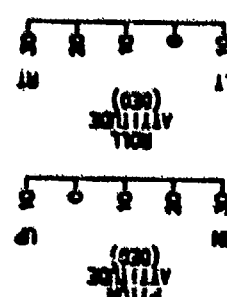
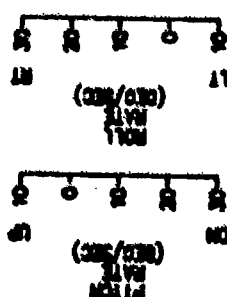
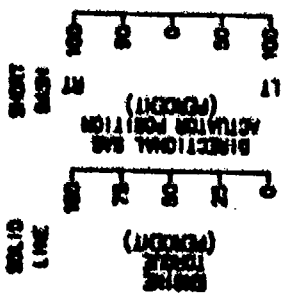


FIGURE E-141
SPIRAL STABILITY

JOH-00C USA S/N 70-15340
TRIM CALIBRATED AIRSPEED (KNOTS) 63
STABILITY AUGMENTATION SYSTEM OFF
TRIM ROTOR SPEED (RPM) 354
AVG DENSITY ALT (DEG C) 18.5
AVG ALTITUDE (FEET) 6070
AVG CG LAT (IN) 0.1 LT
AVG CG LONG (PS) 108.0
AVG CROSS WEIGHT (LB) 2040

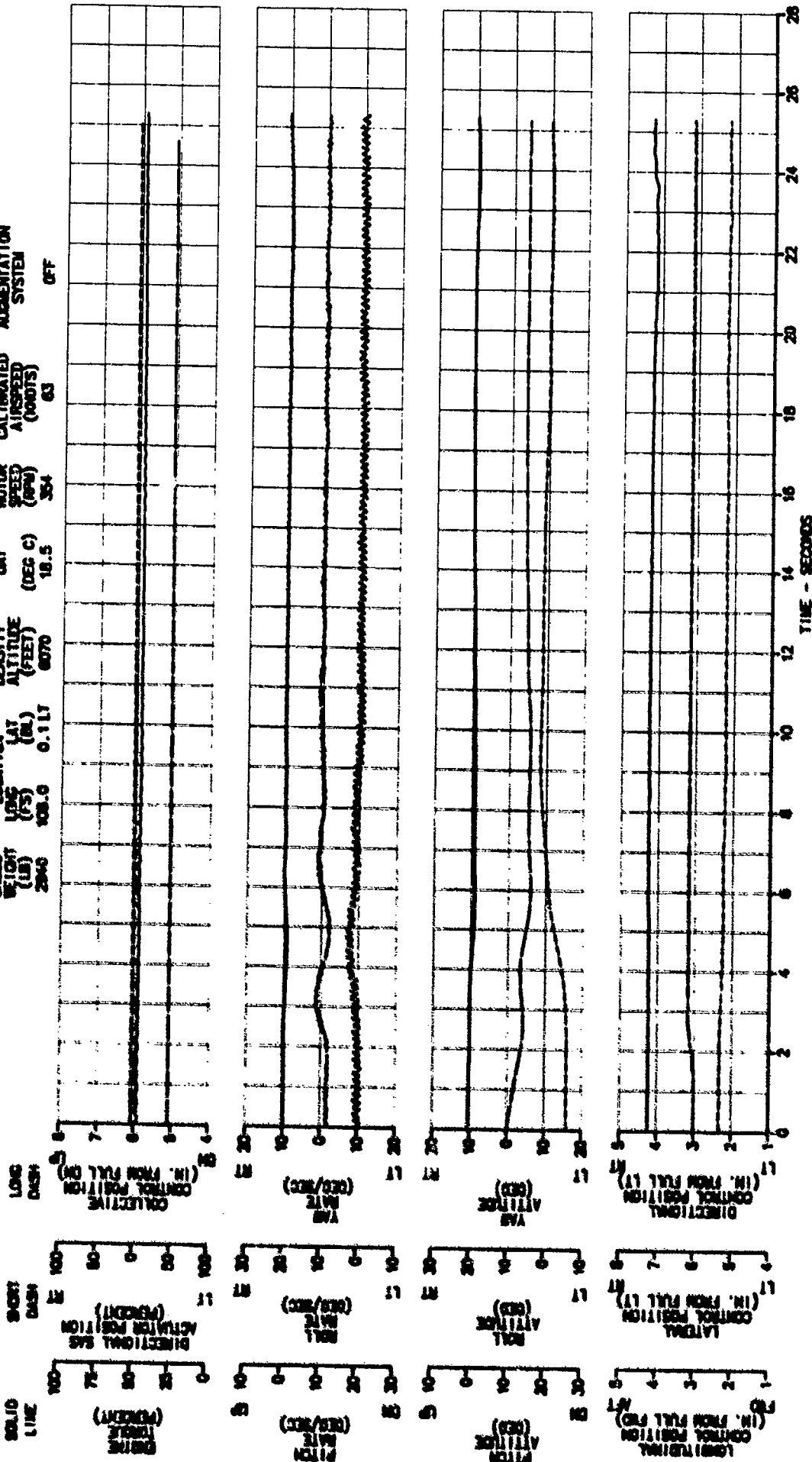


FIGURE E-142
SPIRAL STABILITY

JOH-SEC USA S/N 70-15240

STABILITY
AUGMENTATION
SYSTEM
ON

TRIM
CALIBRATED
AIRSPEED
(KNOTS)
67

TRIM
ROTOR
SPEED
(RPM)
354

AVE
QAF
(DEG C)
19.5

AVE
DENSITY
ALTITUDE
(FEET)
3000

AVE OF
LOCATION
LAT
(N)
0.1 LT

AVE
GROSS
WEIGHT
(LB)
2570

LONG
CHART
COLLECTIVE
CONTROL POSITION
(IN. FROM FALL LV)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

ROLL
CHART
ROLL
RATE
(DEG/SEC)
RT

TIME - SECONDS

FIGURE E-143
SPIRAL STABILITY

JUN-DEC USA S/N 70-15349
 AVG CROSS WEIGHT (LB) 2840
 AVG CS LONG (FT) 102.0
 AVG CS LAT (IN) -0.11
 AVG DENSITY ALTITUDE (FEET) 8000
 AVG OAT (DEG C) 19.0
 TRIM MOTOR SPEED (RPM) 354
 TRIM CALIBRATED AIRSPEED (KNOTS) 64
 STABILITY AUGMENTATION SYSTEM OFF

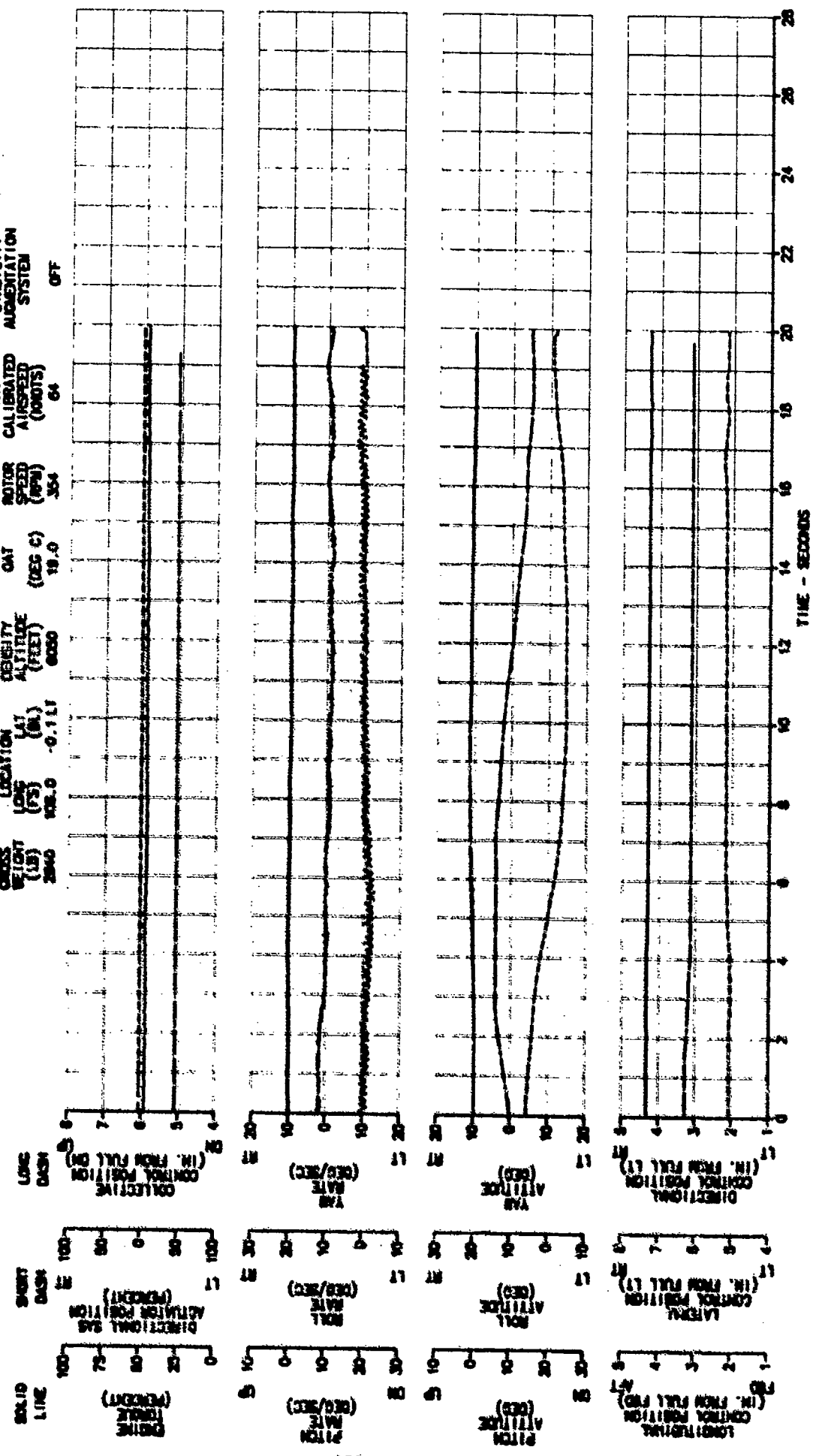


FIGURE E-144
SPIRAL STABILITY
JOM-58C USA S/N 70-15340

TRIM CALIBRATED
102
STABILITY
SYSTEM
ON

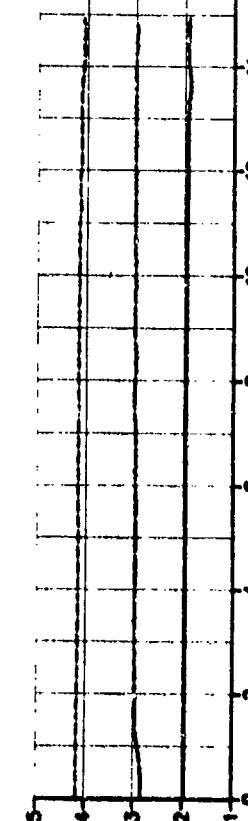
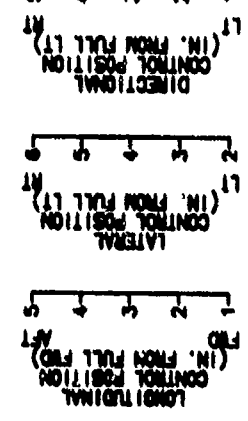
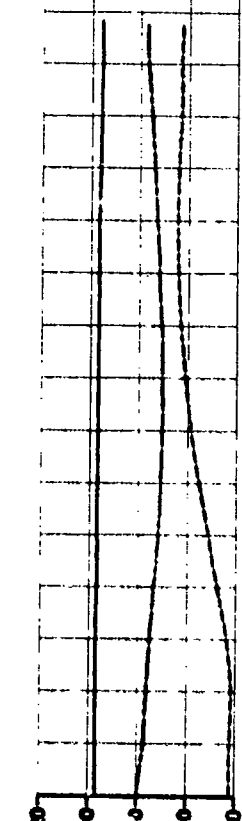
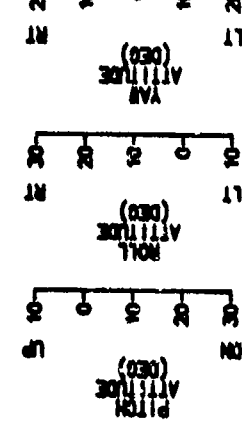
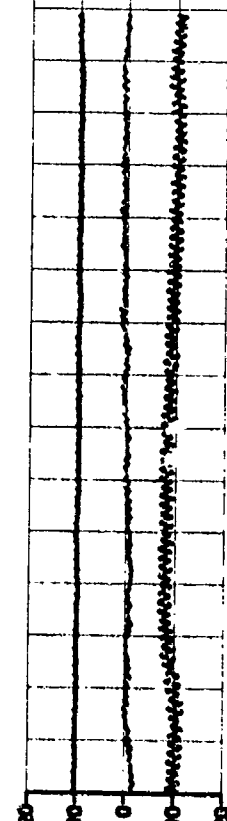
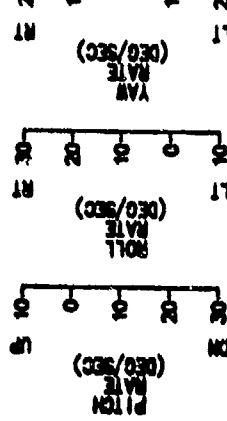
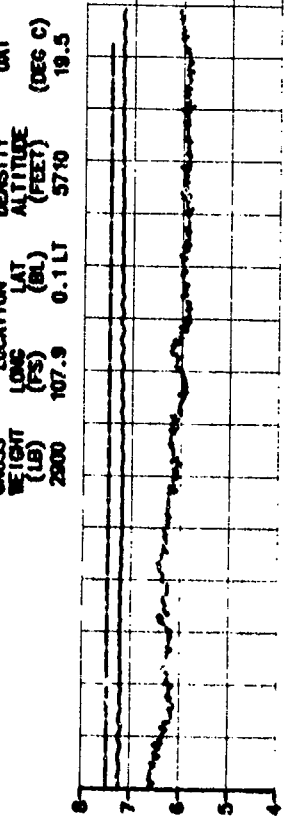
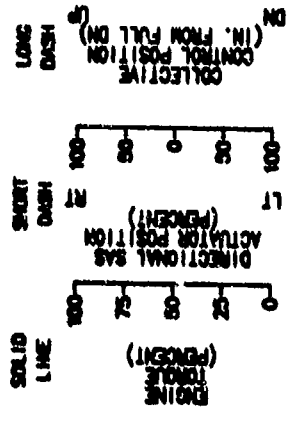
AVG GROSS
WEIGHT
(LB)
2800

AVG CG
LOCATION
LONG (FS)
107.9

AVG ALTITUDE
(FEET)
5770

AVG QAT
(DEG C)
19.5

TRIM
RPM
354



TIME - SECONDS

FIGURE E-145
SPIRAL STABILITY

JOH-58C USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM
OFF

TRIM
CALIBRATED
AIRSPEED
(KNOTS)
102

TRIM
ROTOR
SPEED
(RPM)
354

AVG
OAT
(DEG C)
19.0

AVG
DENSITY
ALTITUDE
(FEET)
5000

AVG CG
LOCATION
LONG (FS)
107.8

AVG CG
LOCATION
LAT (BL)
0.1 LT

AVG
GROSS
WEIGHT
(LB)
2670

LONG DASH
COLLECTIVE
(IN. FROM FULL ON)

SHORT DASH
DIRECTIONAL SAS
ACTUATOR POSITION
(PERCENT)

SOLID LINE
ENGINE TORQUE
(PERCENT)

LT
RT
YAW RATE
(DEG/SEC)

LT
RT
ROLL RATE
(DEG/SEC)

DN
UP
PITCH RATE
(DEG/SEC)

LT
RT
YAW ATTITUDE
(DEG)

LT
RT
ROLL ATTITUDE
(DEG)

DN
UP
PITCH ATTITUDE
(DEG)

LT
RT
DIRECTIONAL
CONTROL POSITION
(IN. FROM FULL LT)

LT
RT
LATERAL
CONTROL POSITION
(IN. FROM FULL RT)

LT
RT
LONGITUDINAL
CONTROL POSITION
(IN. FROM FULL RT)

TIME - SECONDS

FIGURE E-146
SPIRAL STABILITY

JOM-68C USA S/N 70-15349

TRIM .
CALIBRATED
AIRSPEED
(KNOTS) 101

TRIM
ROTOR
SPEED
(RPM) 304

AVG
GROSS
WEIGHT
(LB) 2500

AVG
DENSITY
ALTITUDE
(FEET) 5000

AVG
LONG-
TERM
(FS) 107.9

AVG
LAT
(BL) 0.1 LT

AVG
OAT
(DEG C) 19.5

STABILITY
AUGMENTATION
SYSTEM ON

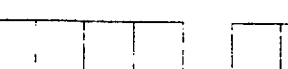
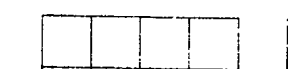
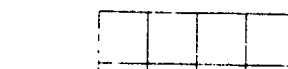
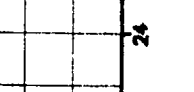
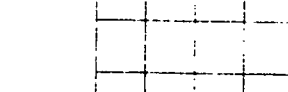
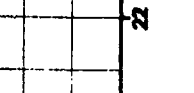
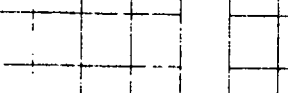
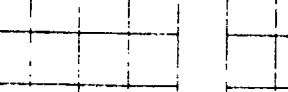
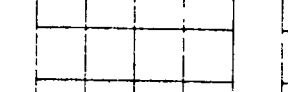
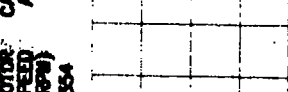
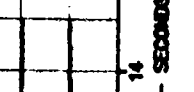
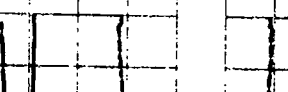
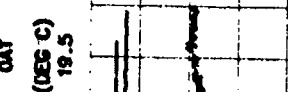
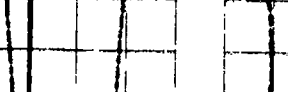
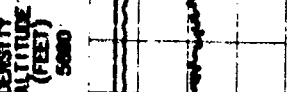
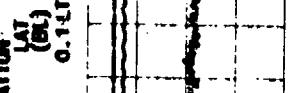
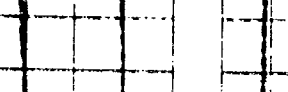
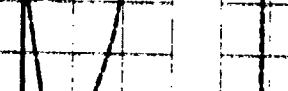
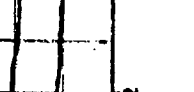
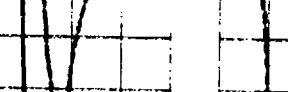
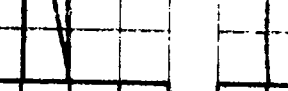
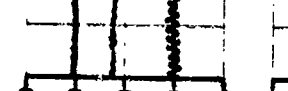
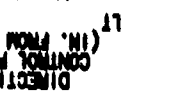
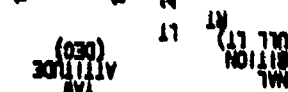
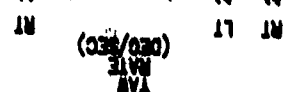
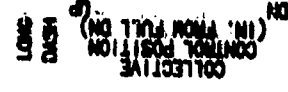
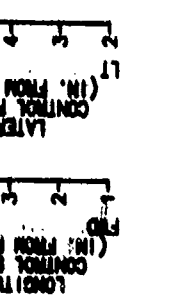
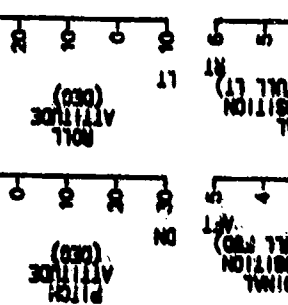
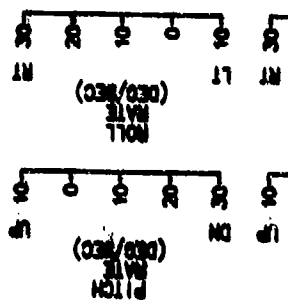
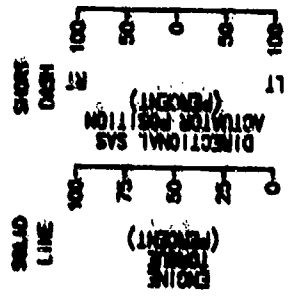


FIGURE E-147
SPIRAL STABILITY

JOH-58C USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM
OFF

TRIM
CALIBRATED
AIRSPEED
(KNOTS)

102

TRIM
ROTOR
SPEED
(RPM)

354

AVG
OAT
(DEG C)

19.5

AVG
DENSITY
ALTITUDE
(FEET)

5770

AVG CG
LOCATION
LAT
(BL)

0.117

AVG
LONG
(PS)

107.8

AVG
GROSS
WEIGHT
(LB)

2060

LONG
DASH
(IN. FROM FULL DN)

COLLECTIVE
CONTROL POSITION

ENGINE
(TONGUE)
(PERCENT)

SHORT
DASH
(PERCENT)

DIRECTIONAL SAS
ACTUATOR POSITION

PITCH
RATE
(DEG/SEC)

ROLL
RATE
(DEG/SEC)

YAW
RATE
(DEG/SEC)

ROLL
ALTITUDE
(DEG)

PITCH
ALTITUDE
(DEG)

LONGITUDINAL
CONTROL POSITION
(IN. FROM FULL PD)

LATERAL
CONTROL POSITION
(IN. FROM FULL LT)

YAW
ALTITUDE
(DEG)

ROLL
ALTITUDE
(DEG)

DIRECTIONAL
CONTROL POSITION
(IN. FROM FULL LT)

TIME - SECONDS

FIGURE E-148
LONGITUDINAL LONG-TERM RESPONSE

304-500 LBN S/N 70-15340
TRIM CALIBRATED
AIRSPEED (KNOTS) 67
STABILITY
AUGMENTATION
SYSTEM ON

AVG CG
LOCATION
LONG (FSS) 108.1
LAT (ML) 0.1 LT
AVG DENSITY 5740
ALTITUDE (FEET) 19.0
TRIM Rotor
SPEED (RPM) 354

AVG GROSS
WEIGHT (LB) 2200

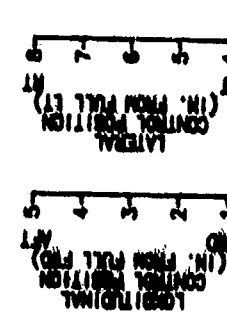
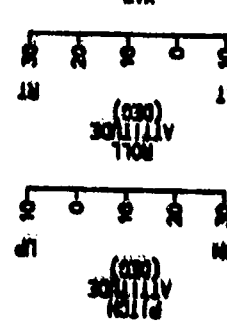
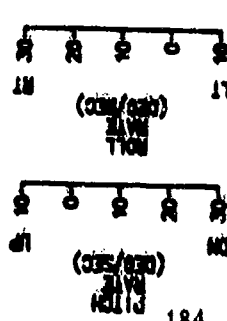
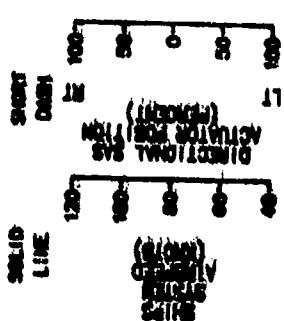
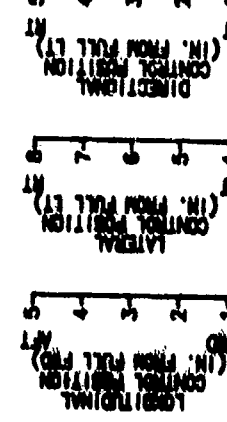
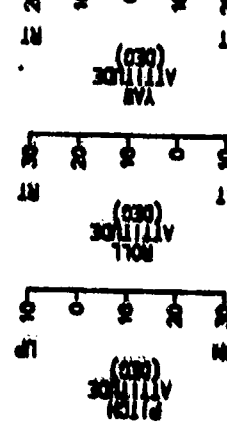
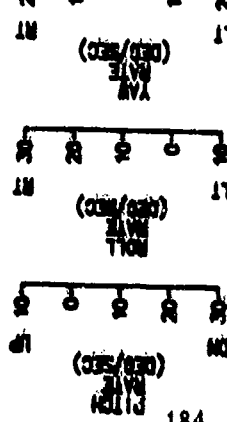
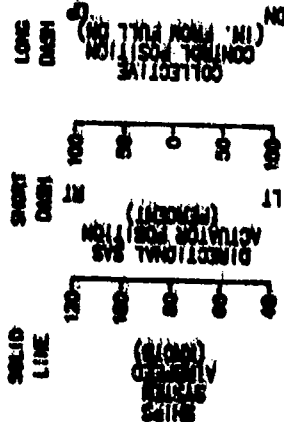


FIGURE E-149
LONGITUDINAL LONG-TERM RESPONSE

JM-58C USA S/N 70-15349
 TRIM CALIBRATED AIRSPEED (KNOTS) 64
 TRIM ROTOR SPEED (RPM) 354
 AVG DENSITY ALT (DEG C) 18.5
 AVG LOCATION LAT (ML) 0.117
 LONG (FS) 108.0
 AVG CROSS WEIGHT (LB) 2850
 STABILITY AUGMENTATION SYSTEM OFF

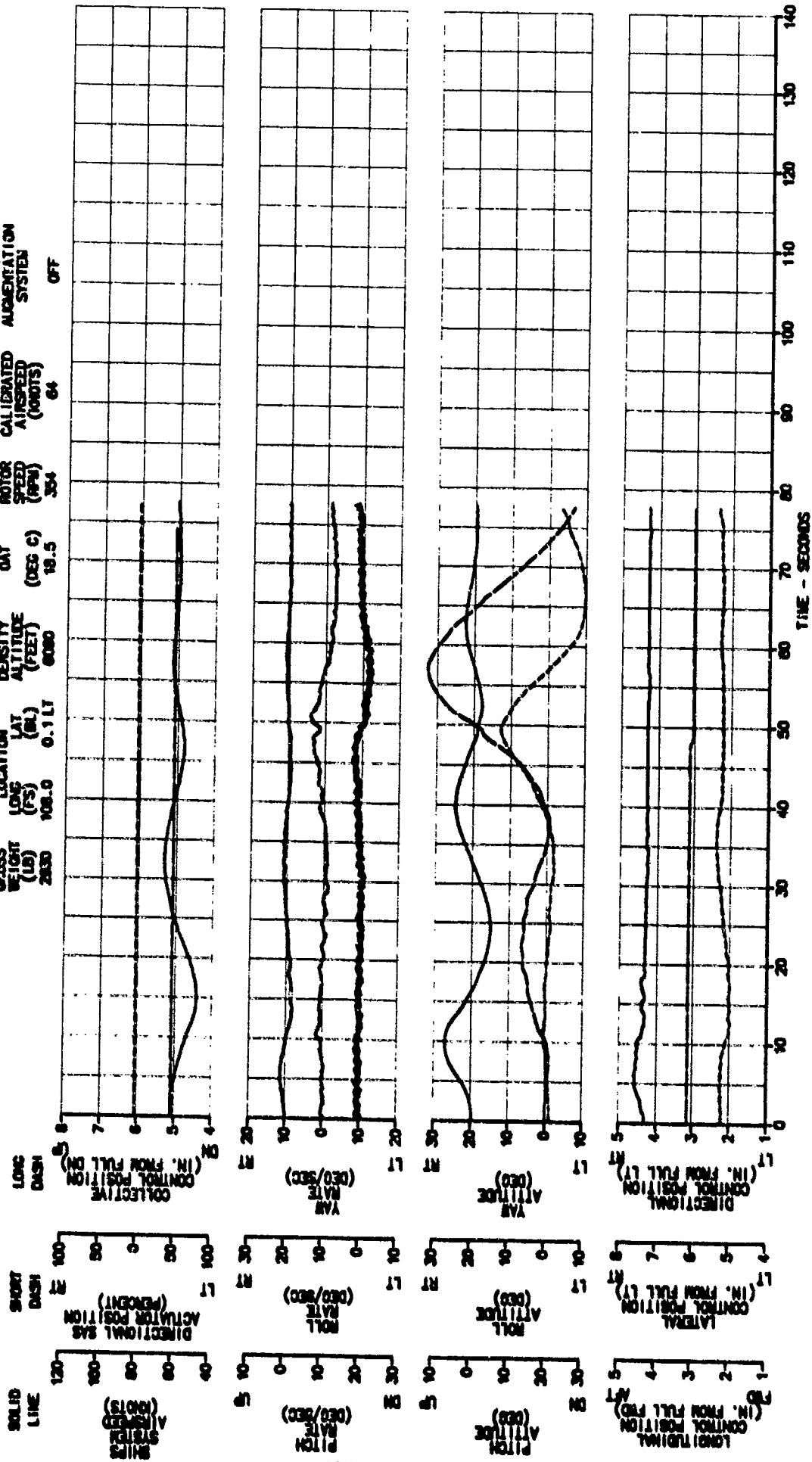


FIGURE E-150
LONGITUDINAL LONG-TERM RESPONSE

JOH-68C USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM
ON

TRIM
CALIBRATED
AIRSPEED
(KNOTS)
101

TRIM
MOTOR
SPEED
(RPM)
354

AVG
DENSITY
ALT
(DEG C)
19.5

AVG
DENSITY
ALTITUDE
(FEET)
5760

AVG CG
LOCATION
LAT
(IN. FROM FULL LT)
0.1 LT

AVG
GROSS
WEIGHT
(LB)
2800

AVG CG
LOCATION
LONG
(PS)
107.9

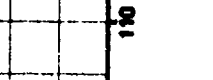
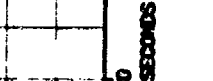
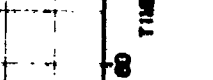
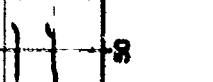
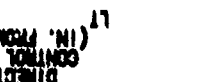
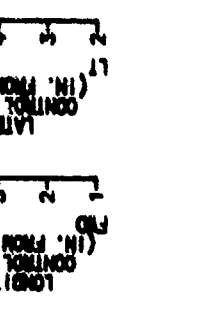
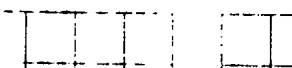
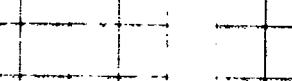
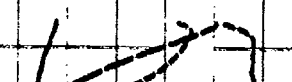
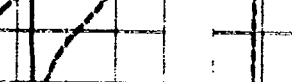
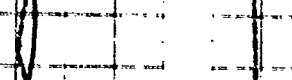
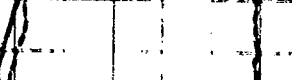
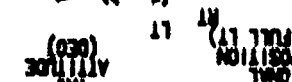
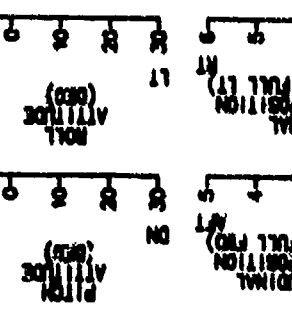
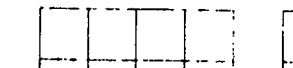
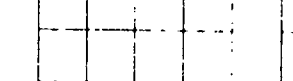
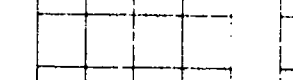
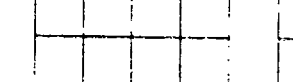
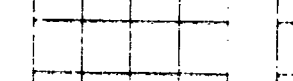
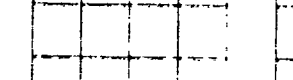
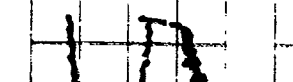
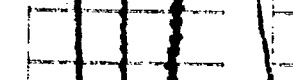
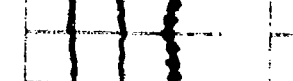
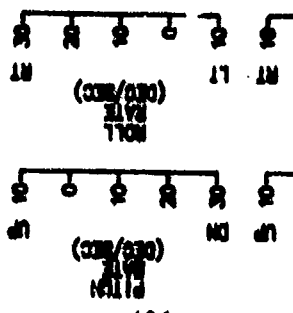
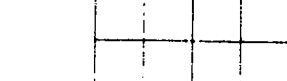
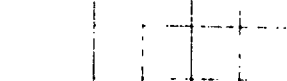
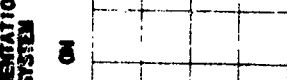
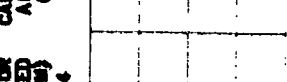
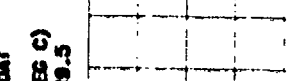
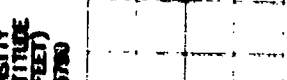
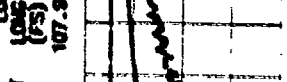
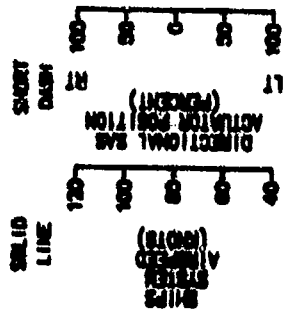


FIGURE E-152
DIRECTIONAL CONTROLLABILITY - HOVER
JOH-58C USA S/N 70-15349

SYM	AVG GROSS WEIGHT (LBS)	CG LOCATION LONG (FS)	LAT (BL)	TRIM DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	TRIM ROTOR SPEED (RPM)	TRIM TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
○	2940	108.1	0.3LT	2400	15	354	0	ON
△	2940	108.0	0.2LT	2500	16	354	0	OFF

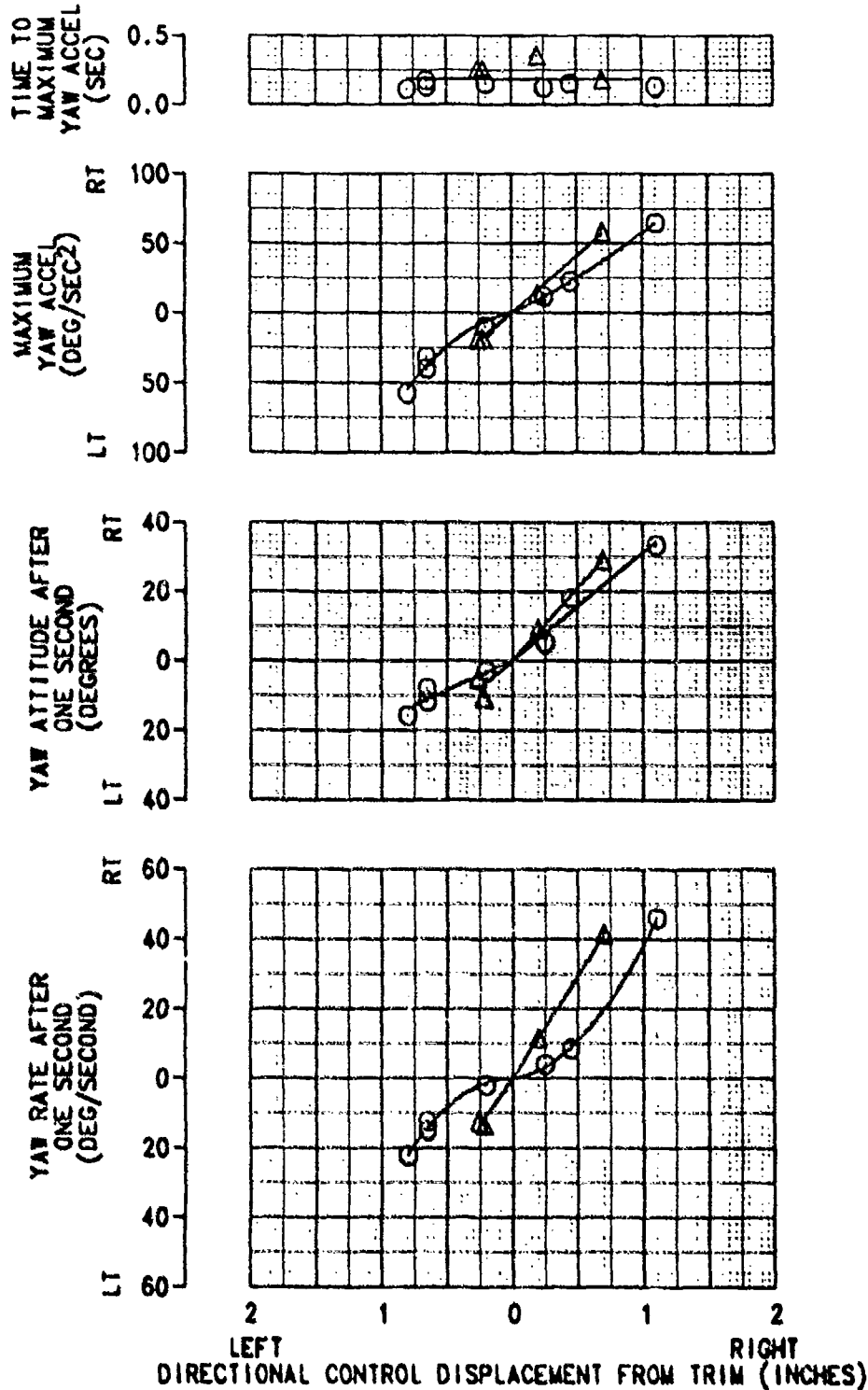


FIGURE E-153
DIRECTIONAL CONTROLLABILITY - 090 DEGREE AZIMUTH
JOH-58C USA S/N 70-15349

SYM	AVG GROSS WEIGHT (LBS)	CG LOCATION LONG (FS)	LAT (BL)	TRIM DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	TRIM ROTOR SPEED (RPM)	TRIM TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
○	2890	108.5	0.0	3300	19.0	354	10	ON
△	2880	108.4	0.0	3350	19.5	354	10	OFF

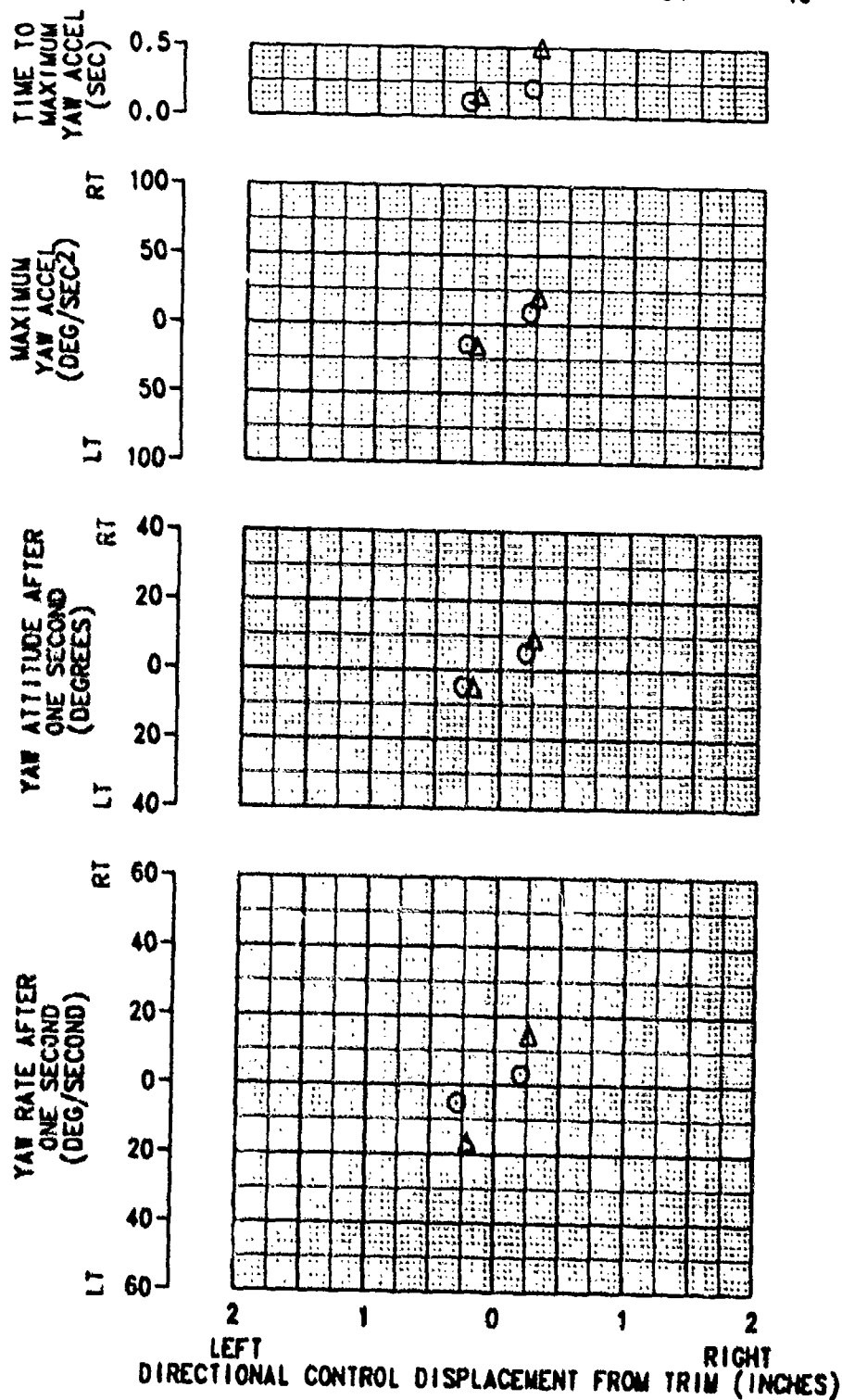


FIGURE E-154
DIRECTIONAL CONTROLLABILITY - 090 DEGREE AZIMUTH
JOH-58C USA S/N 70-15349

SYM	AVG GROSS WEIGHT (LBS)	CG LOCATION LONG (FS)	LAT (BL)	TRIM DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	TRIM ROTOR SPEED (RPM)	TRIM TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
⊙	2920	106.9	0.0	3250	18.0	353	15	ON
Δ	2910	106.8	0.0	3300	18.5	353	15	OFF

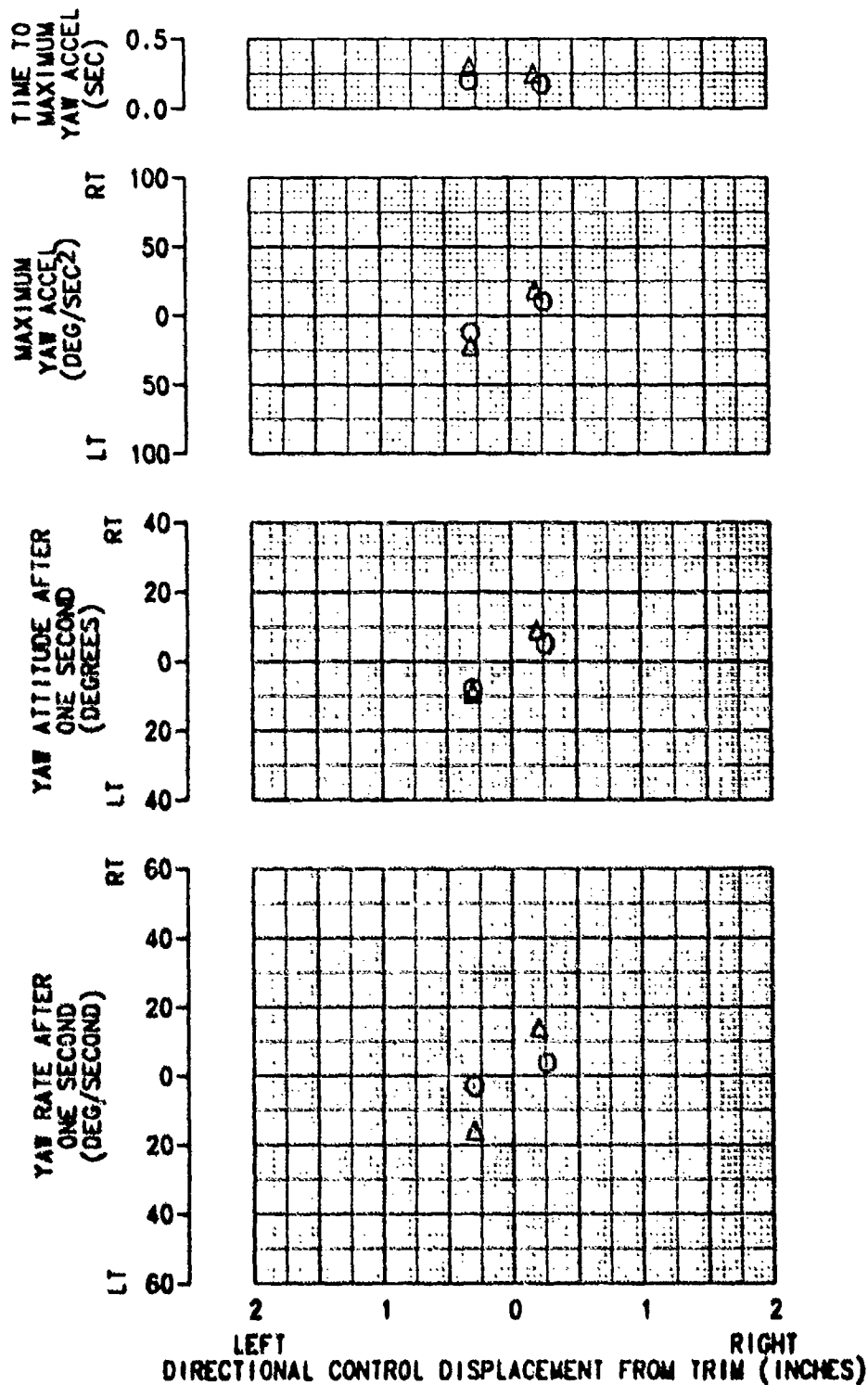


FIGURE E-155
DIRECTIONAL CONTROLLABILITY - 090 DEGREE AZIMUTH
JOH-58C USA S/N 70-15349

SYM	AVG GROSS WEIGHT (LBS)	CG LOCATION LONG (FS)	LAT (BL)	TRIM DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	TRIM ROTOR SPEED (RPM)	TRIM TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
○	2900	106.8	0.0	3200	18.0	353	20	ON
△	2930	106.5	0.0	3200	18.0	353	20	OFF

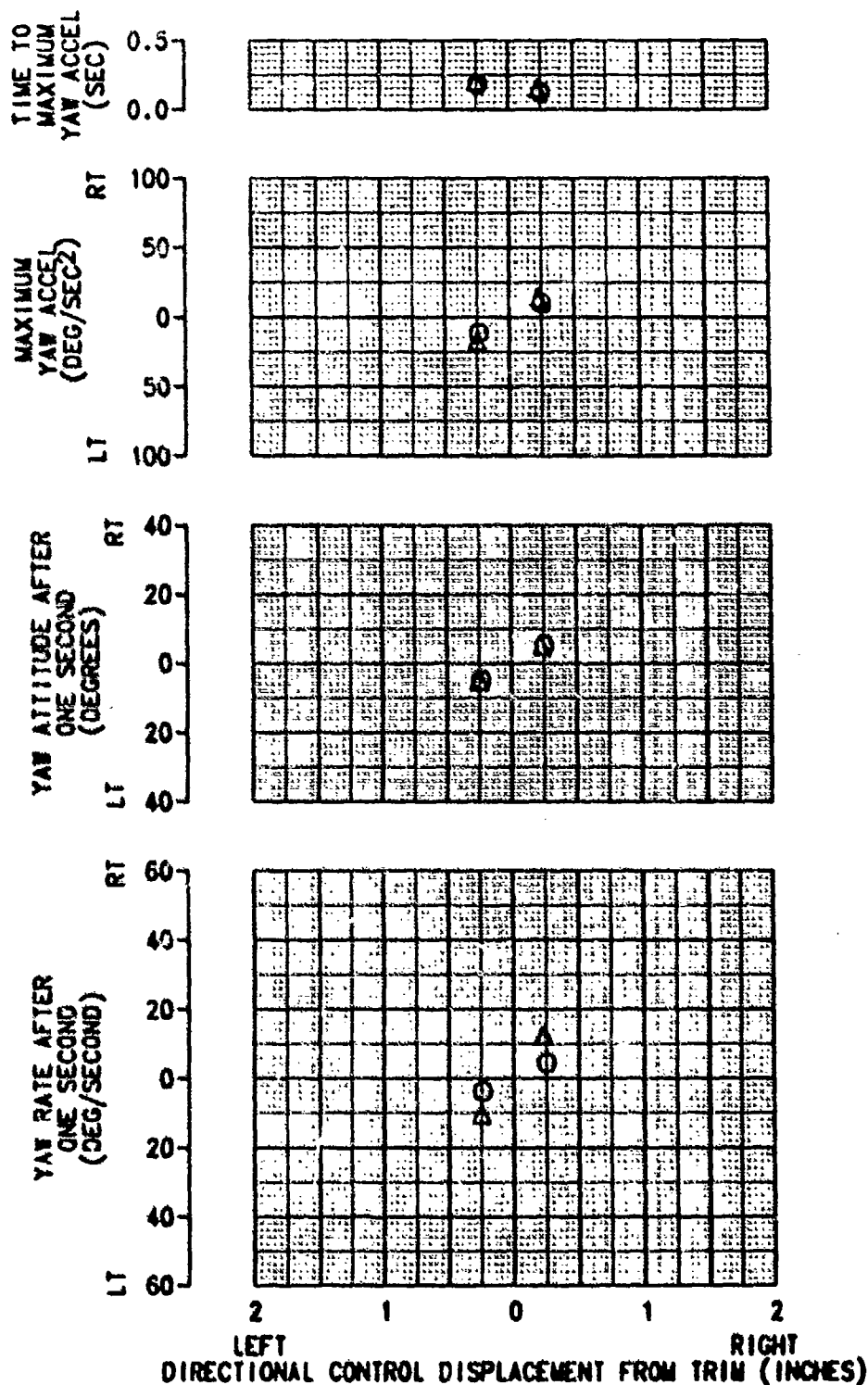


FIGURE E-156
 DIRECTIONAL CONTROLLABILITY - 270 DEGREE AZIMUTH
 JOH-58C USA S/N 70-15349

SYM	AVG GROSS WEIGHT (LBS)	CG LOCATION LONG (FS)	LAT (BL)	TRIM DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	TRIM ROTOR SPEED (RPM)	TRIM TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
○	2910	106.4	0.0	3280	18.5	354	10	ON
△	2890	106.4	0.0	3380	19.5	354	10	OFF

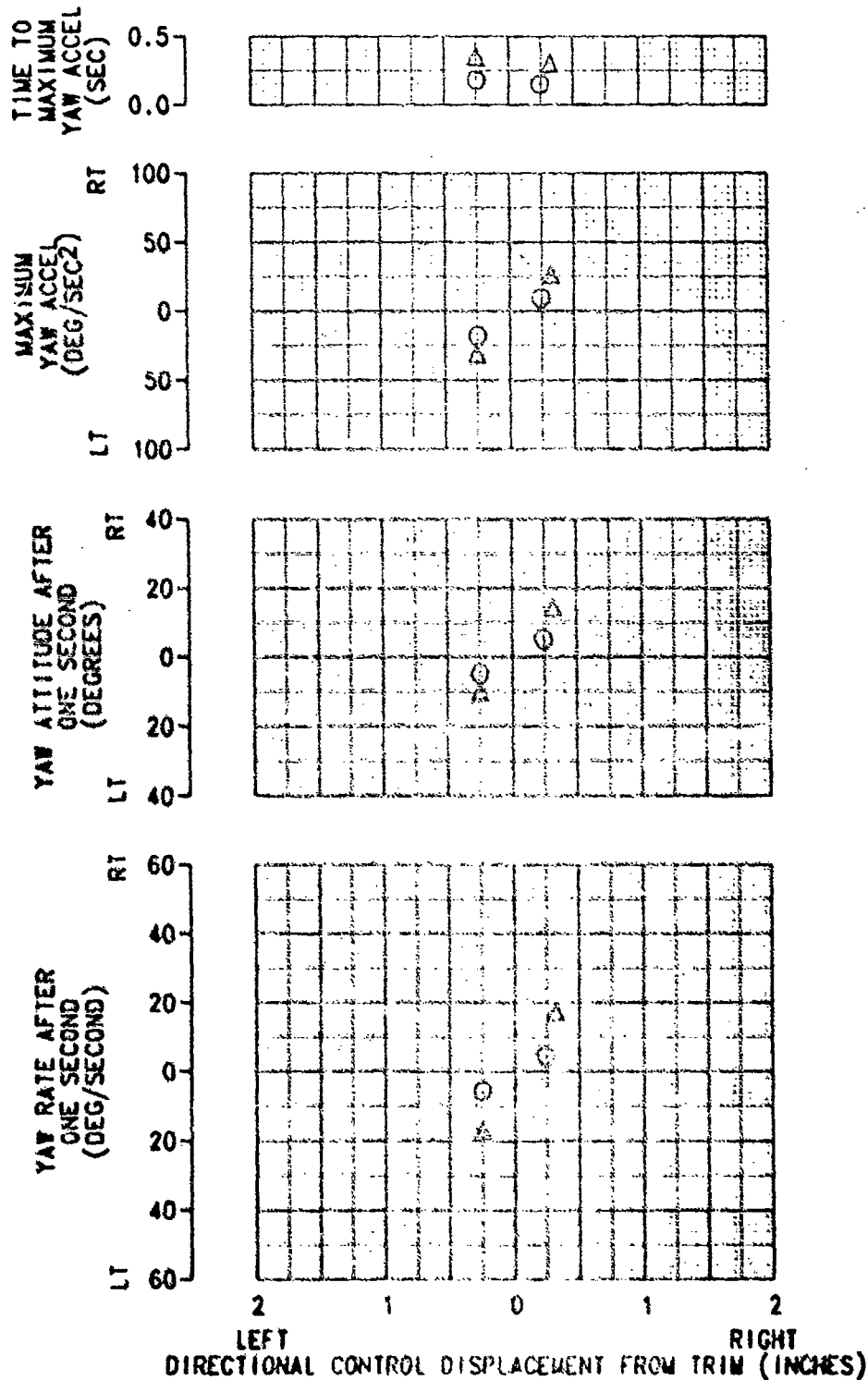


FIGURE E-158
LOW SPEED FLIGHT
180 AND 360 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG CG LOCATION LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
2970	107.7	0.0	3360	19.5	354	10

NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

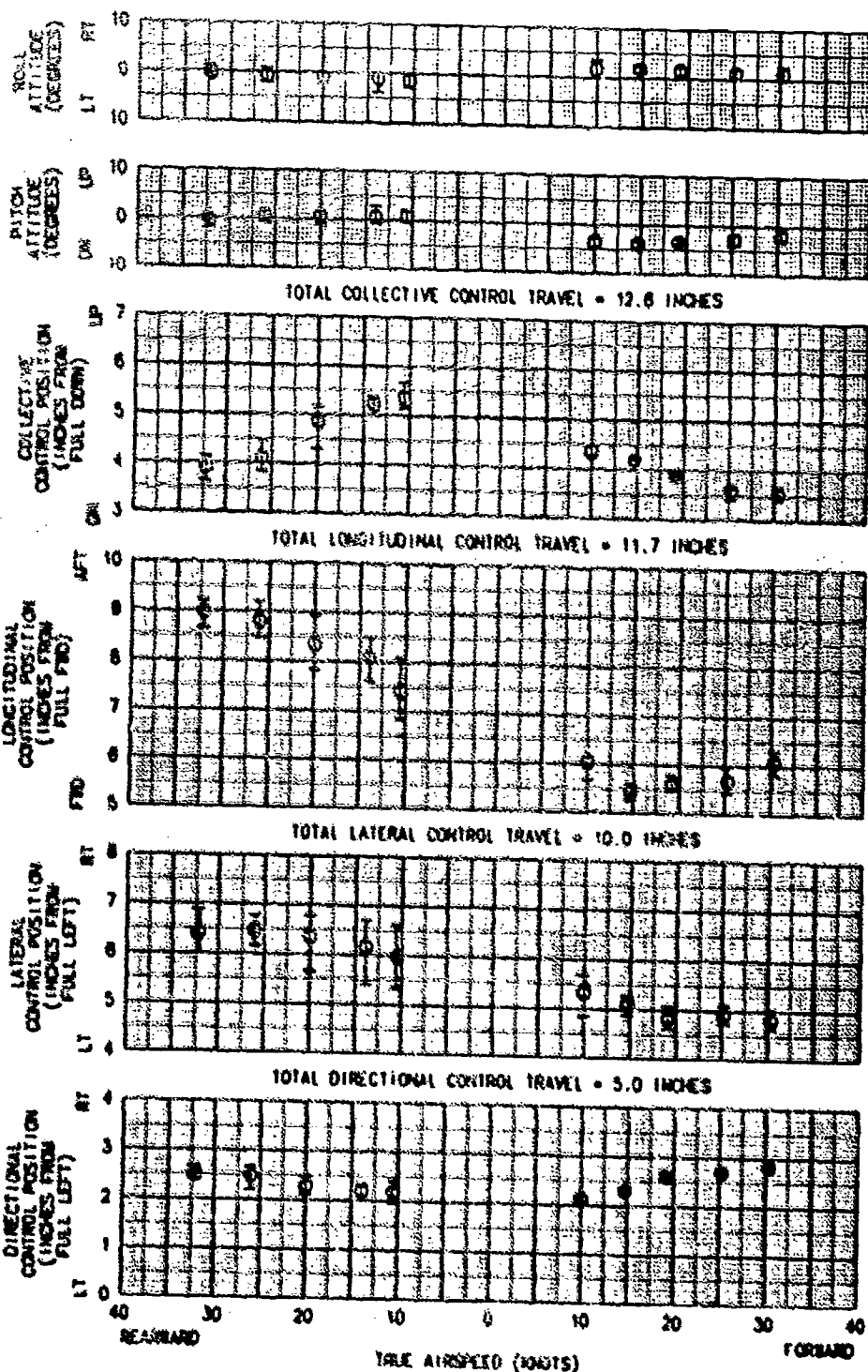
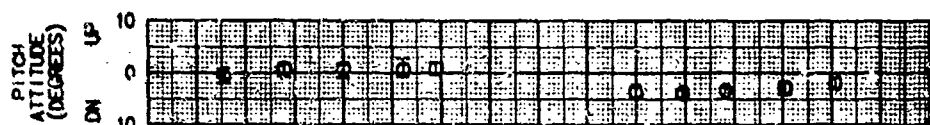
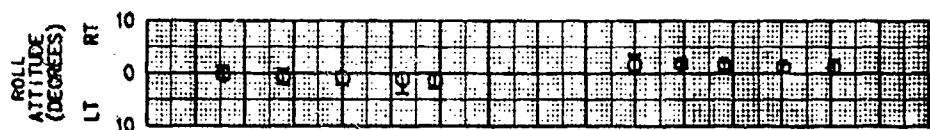


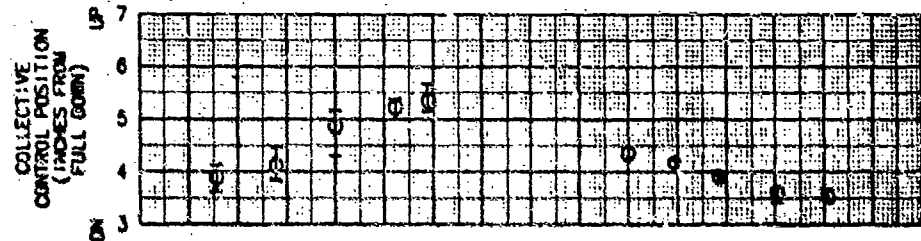
FIGURE E-158
LOW SPEED FLIGHT
180 AND 360 DEGREE AZIMUTH
JOH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG CG LOCATION LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
2970	107.7	0.0	3380	19.5	354	10

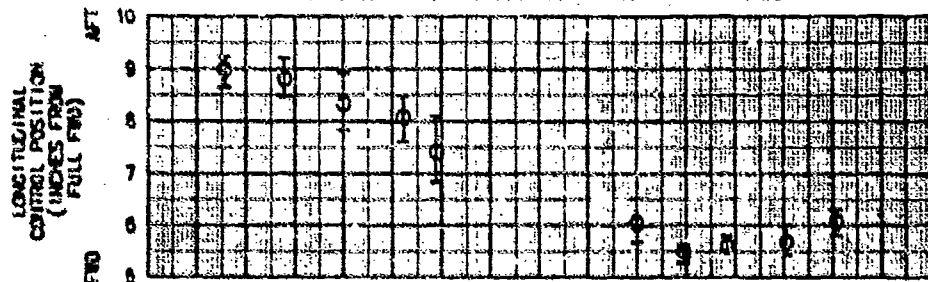
NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS



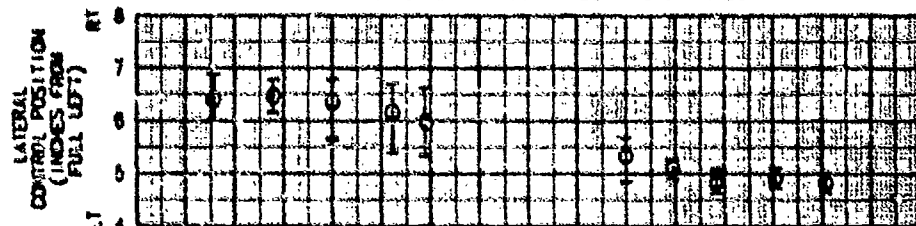
TOTAL COLLECTIVE CONTROL TRAVEL = 12.8 INCHES



TOTAL LONGITUDINAL CONTROL TRAVEL = 11.7 INCHES



TOTAL LATERAL CONTROL TRAVEL = 10.0 INCHES



TOTAL DIRECTIONAL CONTROL TRAVEL = 5.0 INCHES

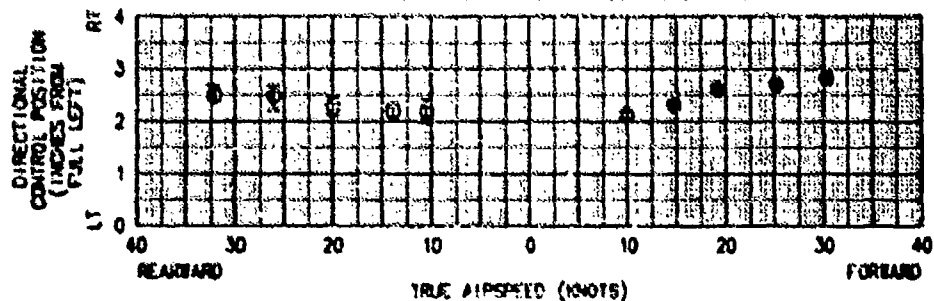


FIGURE E-159
LOW SPEED FLIGHT
180 AND 360 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG CG LOCATION LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
2970	107.7	0.0	3350	19.5	354	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

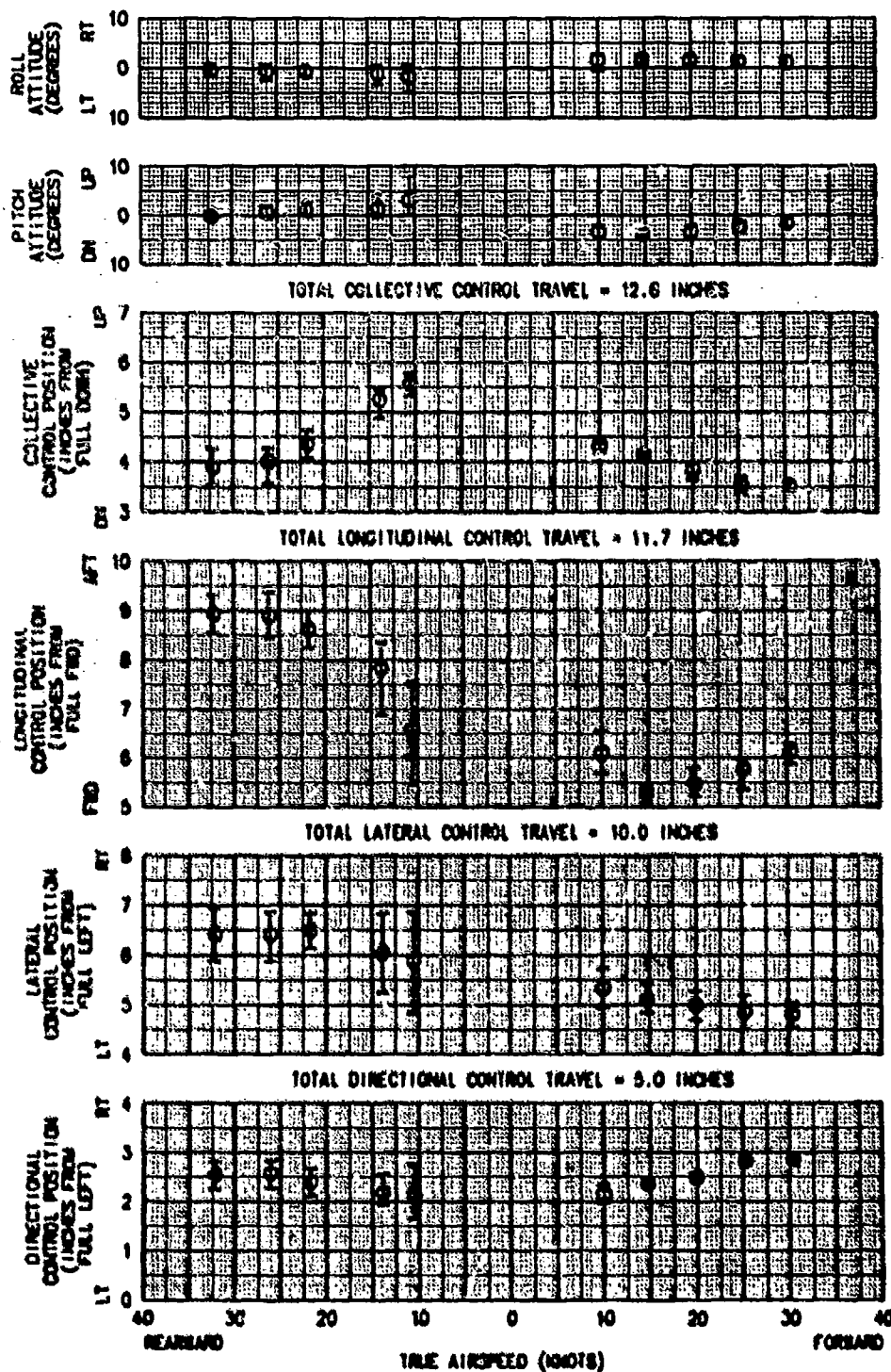


FIGURE E-180
LOW SPEED FLIGHT
45 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
2950	107.2	0.0	3020	16.5	354	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

ROLL ATTITUDE (DEGREES)
RT
LT

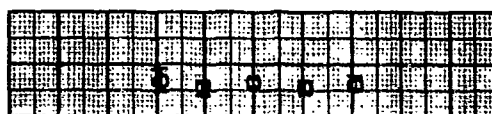
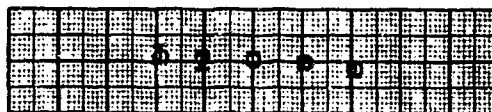
PITCH ATTITUDE (DEGREES)
UP
DN

COLLECTIVE CONTROL POSITION (INCHES FROM FULL DOWN)
UP
DN

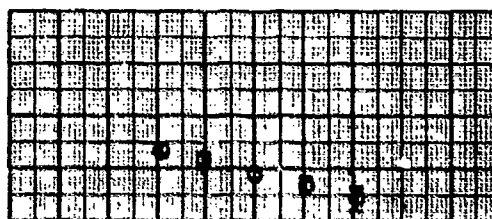
LONGITUDINAL CONTROL POSITION (INCHES FROM FULL FWD)
AFT
FWD

LATERAL CONTROL POSITION (INCHES FROM FULL LEFT)
RT
LT

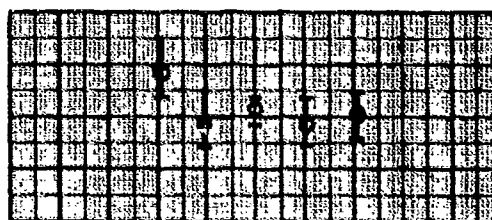
DIRECTIONAL CONTROL POSITION (INCHES FROM FULL LEFT)
RT
LT



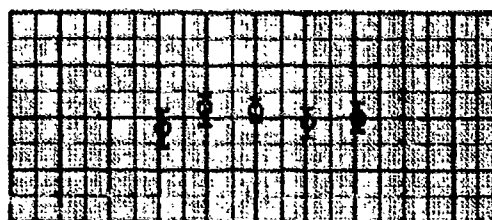
TOTAL COLLECTIVE CONTROL TRAVEL = 12.6 INCHES



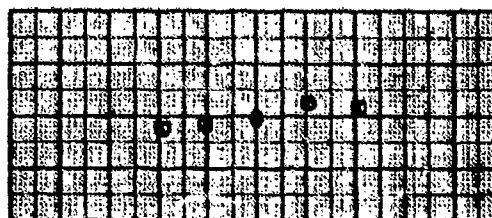
TOTAL LONGITUDINAL CONTROL TRAVEL = 11.7 INCHES



TOTAL LATERAL CONTROL TRAVEL = 10.0 INCHES



TOTAL DIRECTIONAL CONTROL TRAVEL = 5.0 INCHES



TRUE AIRSPEED (KNOTS)

FIGURE E-181
LOW SPEED FLIGHT
45 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
2980	107.1	0.0	3040	18.5	354	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

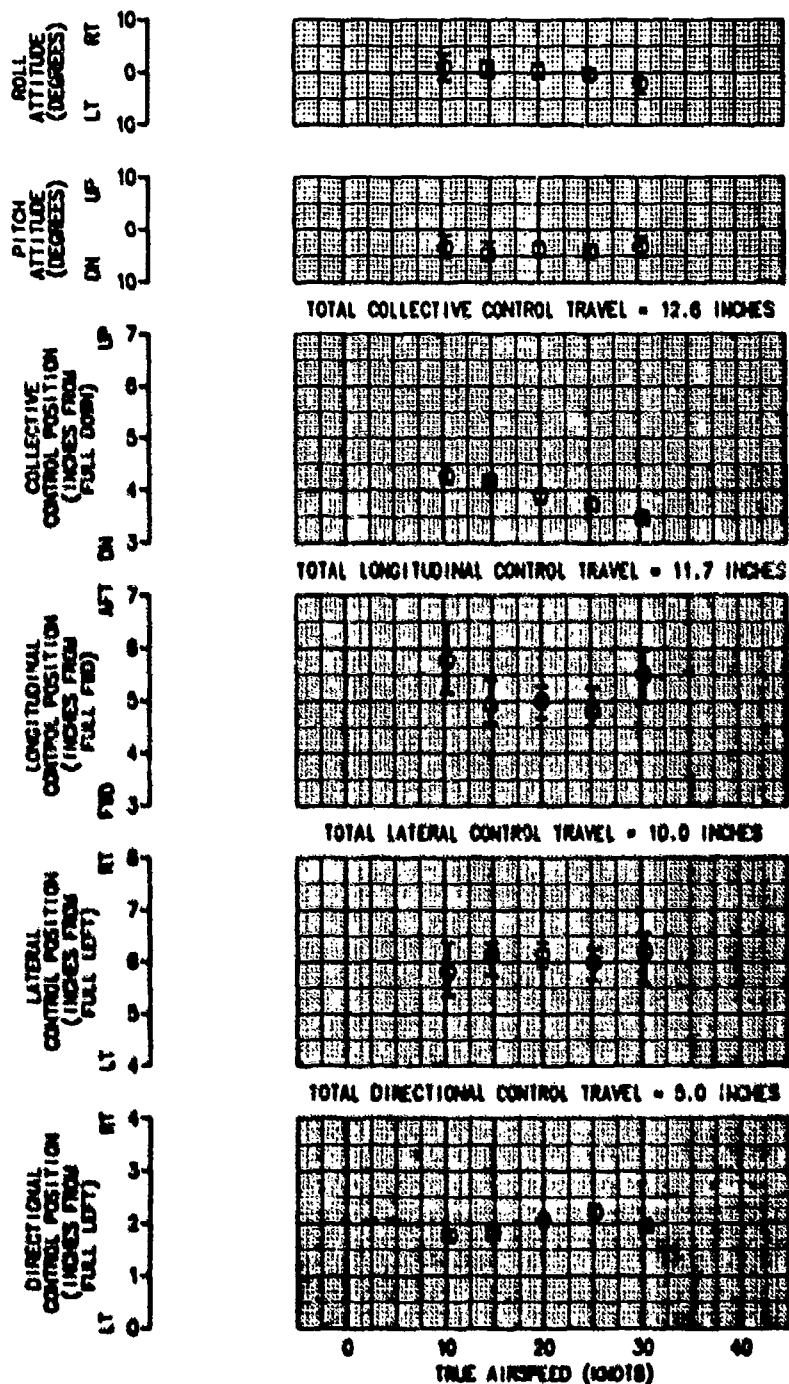


FIGURE E-162
LOW SPEED FLIGHT
270 AND 90 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG CG LOCATION LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
2980	107.2	0.0	3400	20.0	355	10

NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

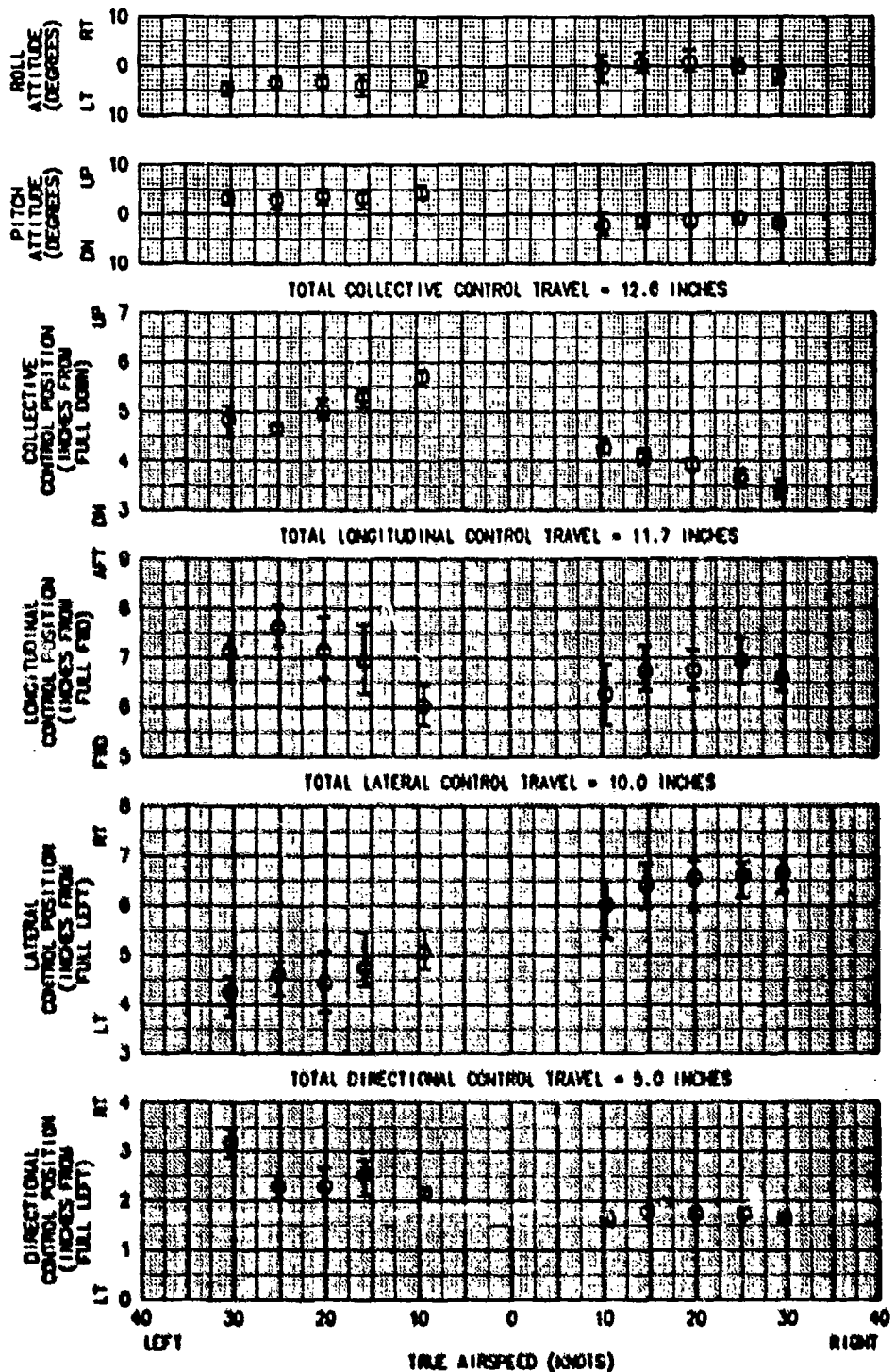


FIGURE E-163
LOW SPEED FLIGHT
270 AND 90 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG CG LOCATION LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
2970	107.2	0.0	3410	20.0	358	10

NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

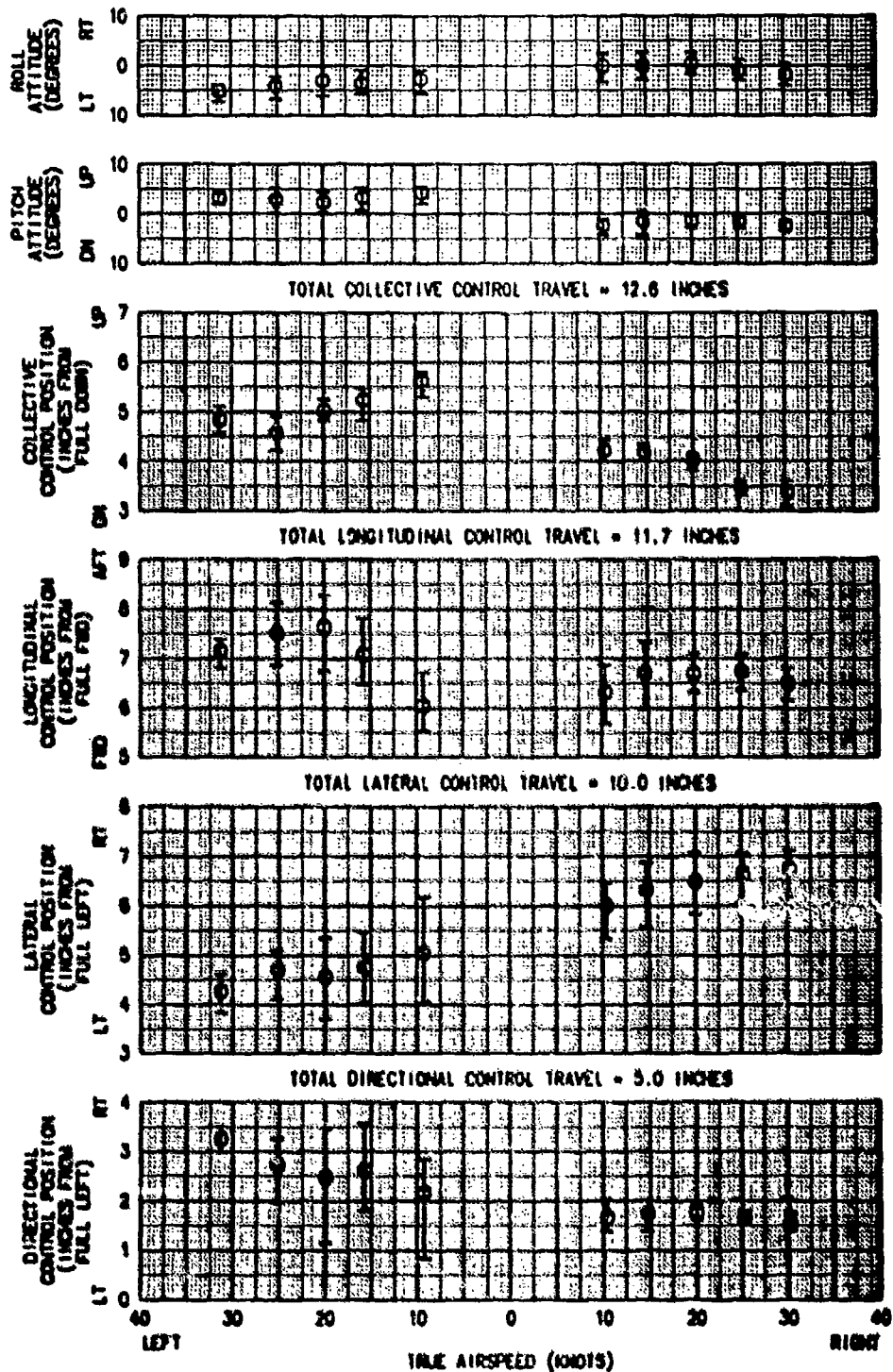


FIGURE E-184
LOW SPEED FLIGHT
120 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG CAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
2980	108.4	0.0	3290	19.0	354	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

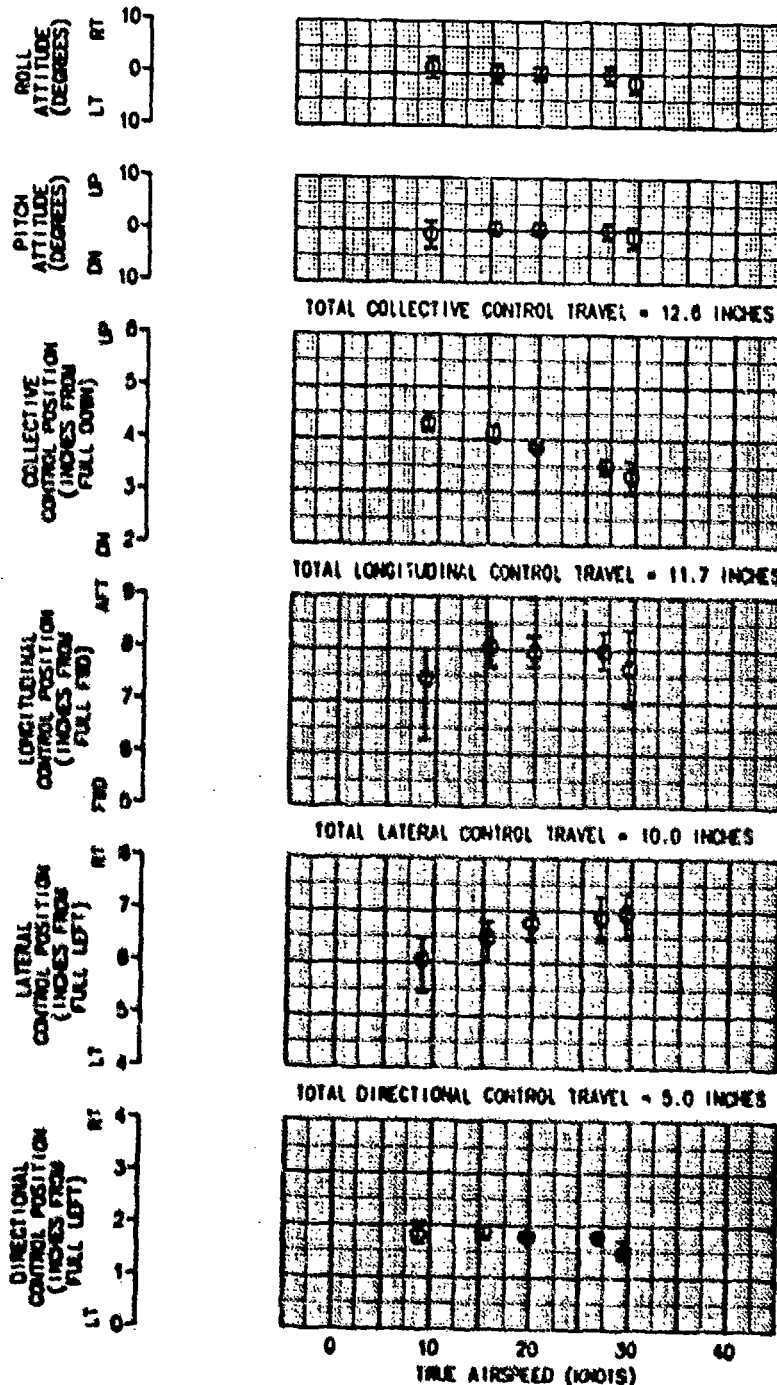


FIGURE E-185
LOW SPEED FLIGHT
120 DEGREE AZIMUTH
J0H-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
LONG (FS)	LAT (BL)					
2980	106.3	0.0	3280	18.5	354	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

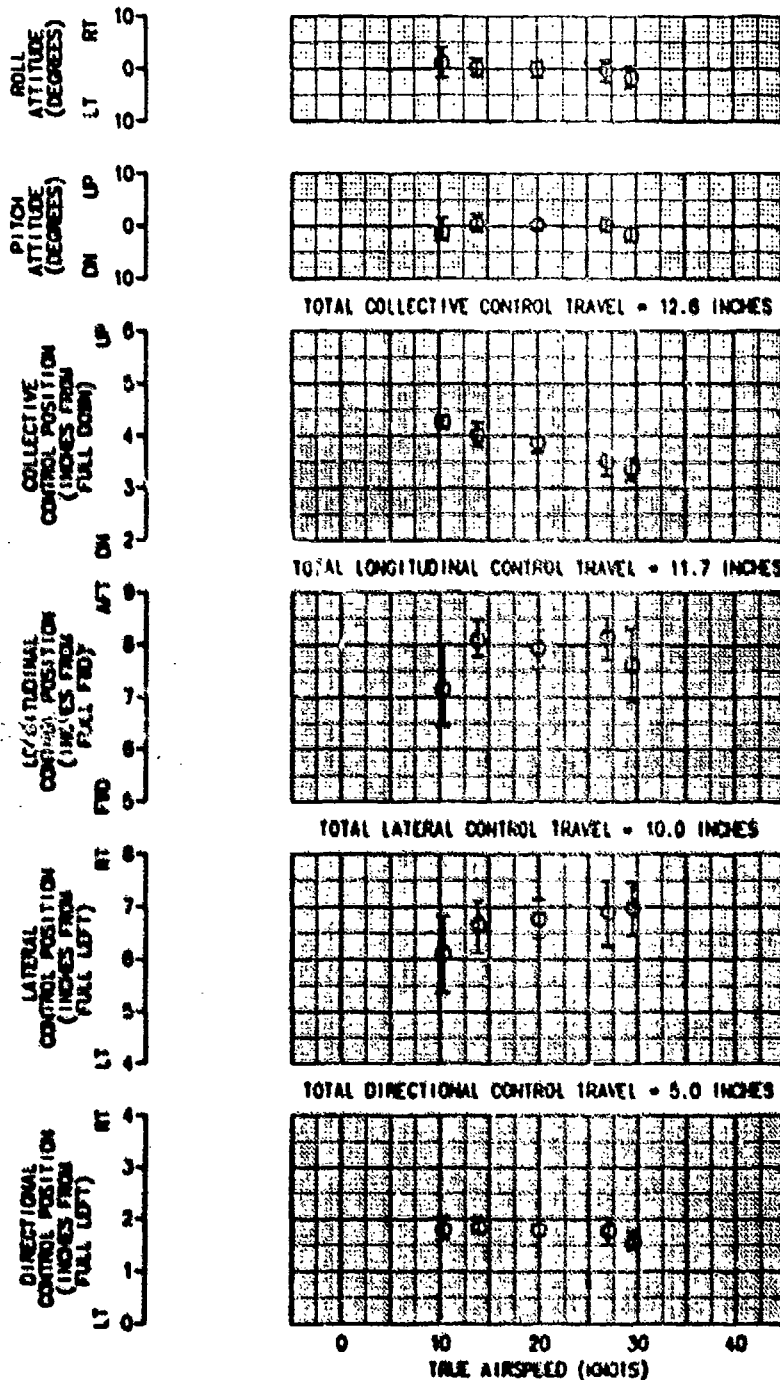


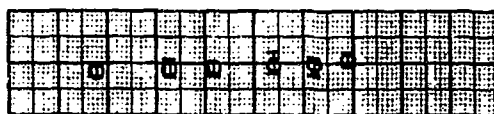
FIGURE E-166
LOW SPEED FLIGHT
150 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
3020	108.1	0.0	3730	23.0	354	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

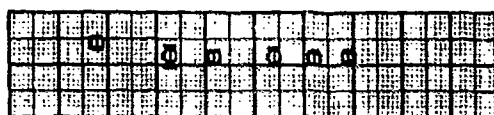
ROLL
ATTITUDE
(DEGREES)

RT
LT



PITCH
ATTITUDE
(DEGREES)

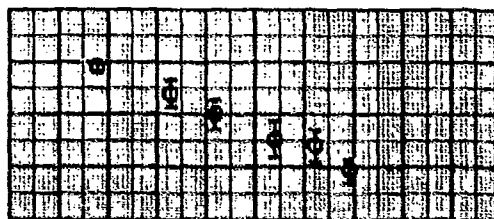
UP
DN



TOTAL COLLECTIVE CONTROL TRAVEL = 12.6 INCHES

COLLECTIVE
CONTROL POSITION
(INCHES FROM
FULL DOWN)

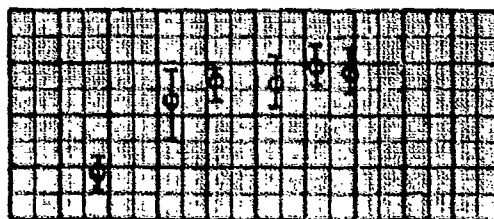
UP
DN



TOTAL LONGITUDINAL CONTROL TRAVEL = 11.7 INCHES

LONGITUDINAL
CONTROL POSITION
(INCHES FROM
FULL FWD)

FTD
AFT



TOTAL LATERAL CONTROL TRAVEL = 10.0 INCHES

LATERAL
CONTROL POSITION
(INCHES FROM
FULL LEFT)

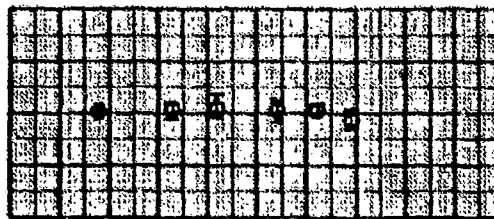
LT
RT



TOTAL DIRECTIONAL CONTROL TRAVEL = 5.0 INCHES

DIRECTIONAL
CONTROL POSITION
(INCHES FROM
FULL LEFT)

LT
RT



TRUE AIRSPEED (KNOTS)

FIGURE E-167
LOW SPEED FLIGHT
150 DEGREE AZIMUTH
Jul 58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
3020	108.1	0.0	3770	23.0	364	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

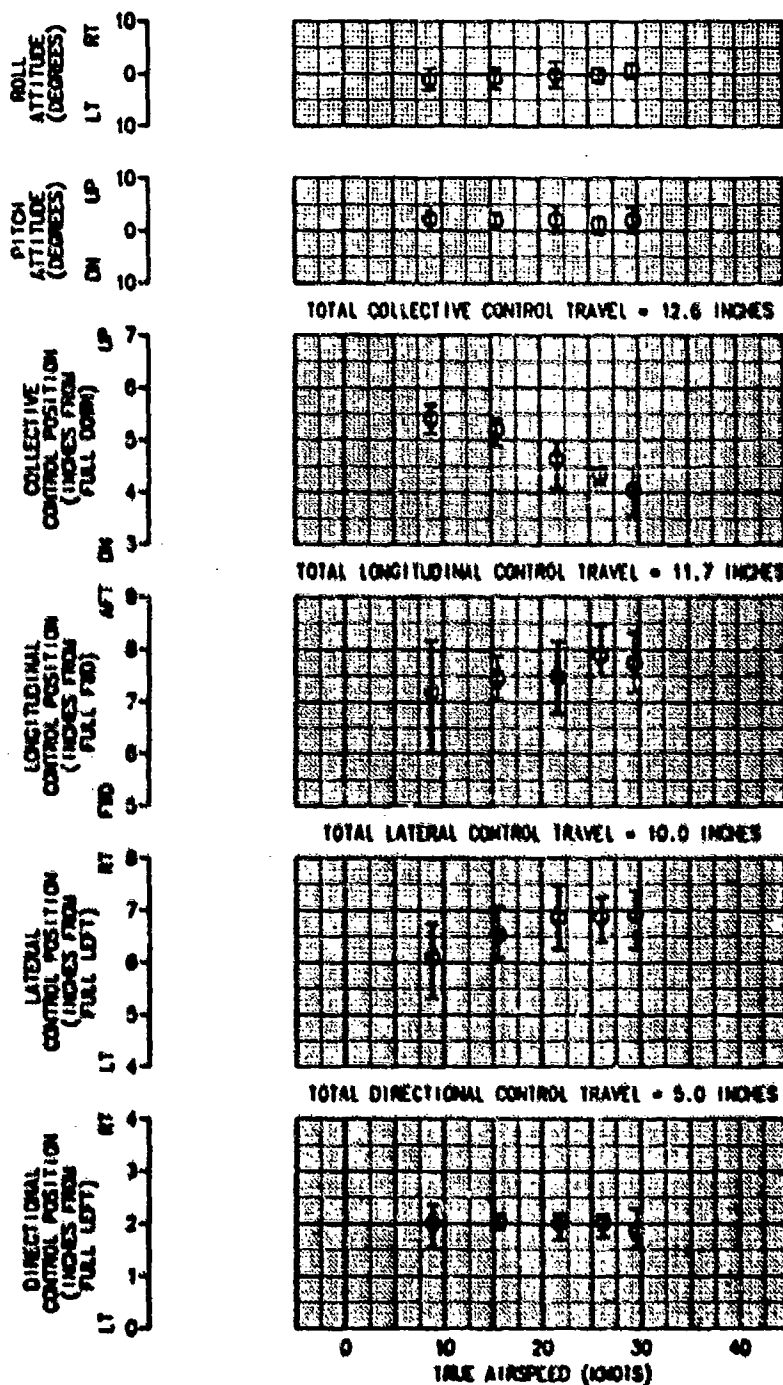


FIGURE E-168
LOW SPEED FLIGHT
210 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
3020	107.2	0.0	4070	25.5	355	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

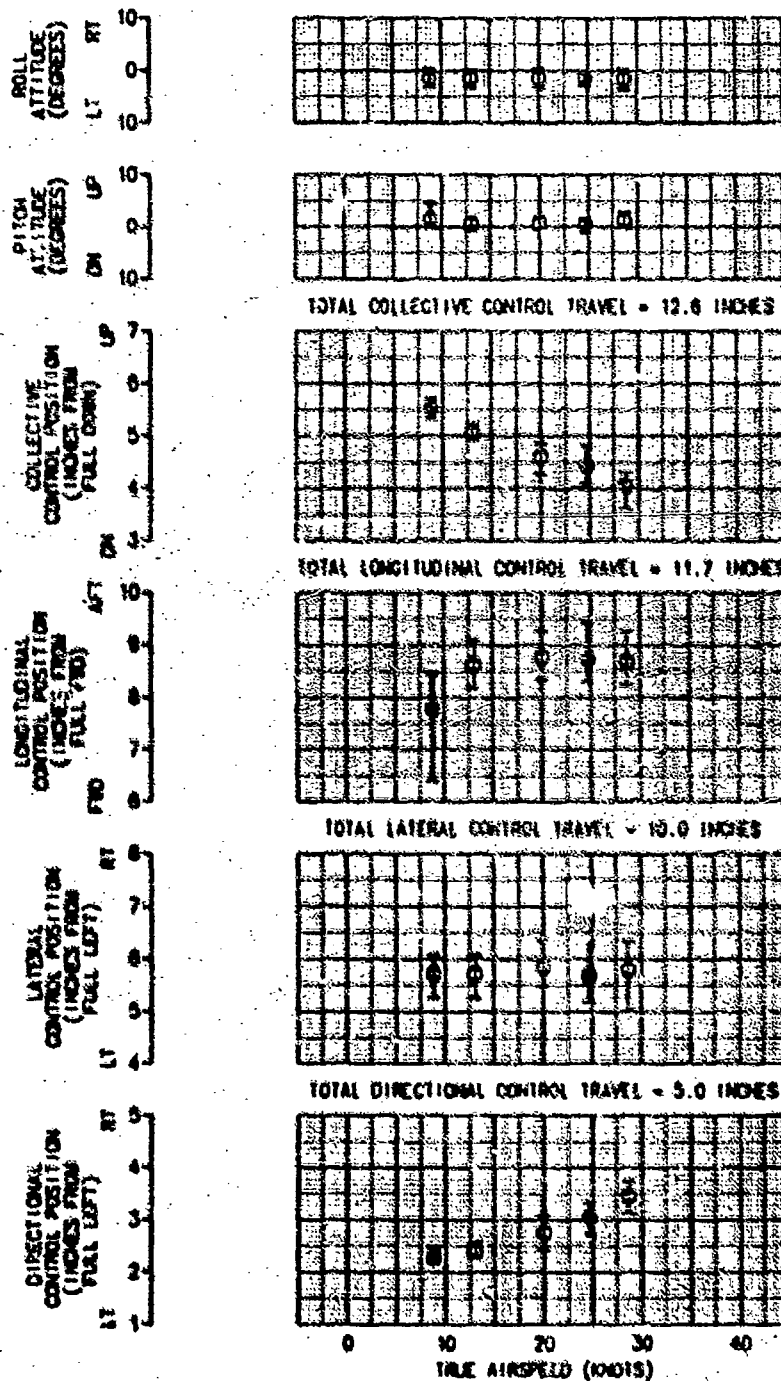


FIGURE E-169
LOW SPEED FLIGHT
210 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
LONG (FS)	LAT (BL)					
3030	107.1	0.0	4040	25.5	355	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

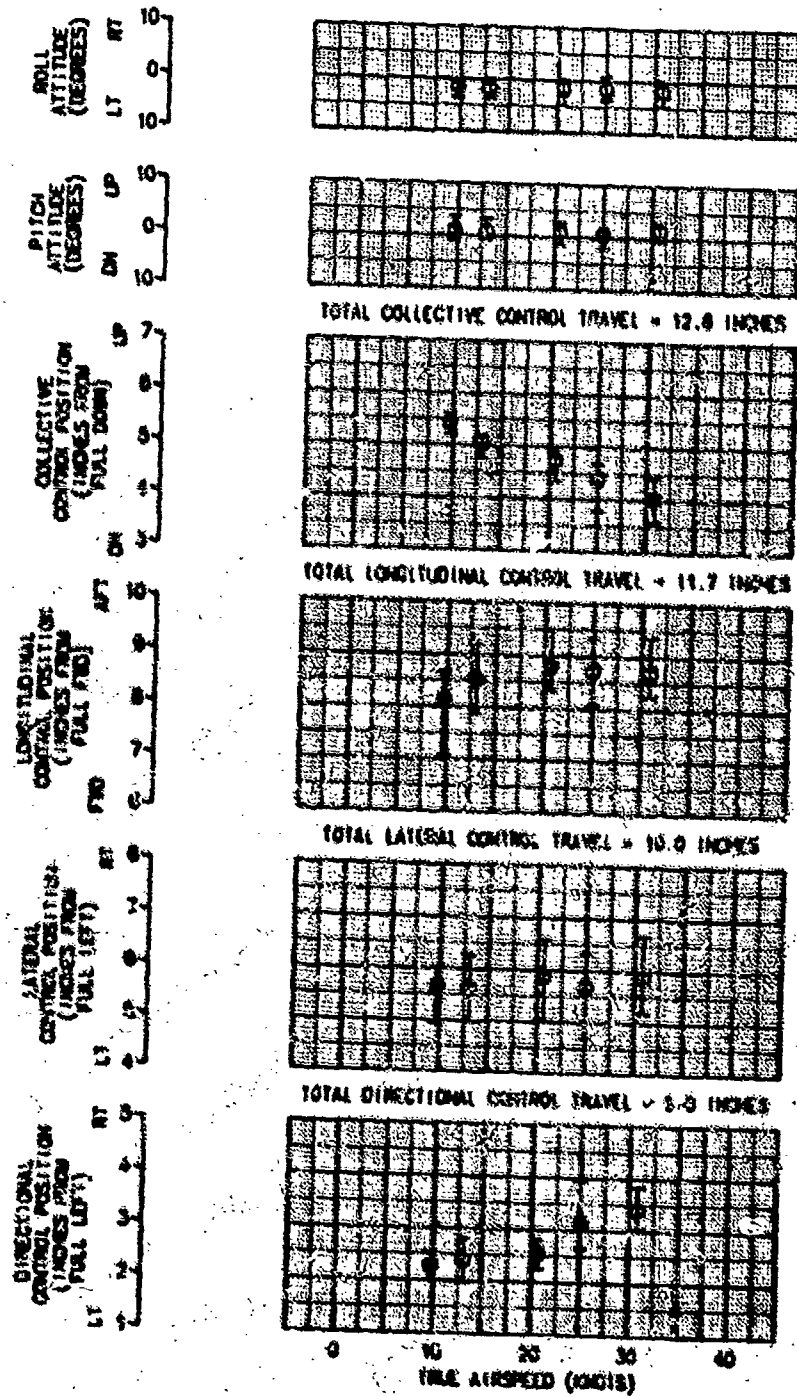


FIGURE E-170
LOW SPEED FLIGHT
225 DEGREE AZIMUTH
JOM-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG CG LOCATION LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
3050	106.8	0.0	4070	25.5	355	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

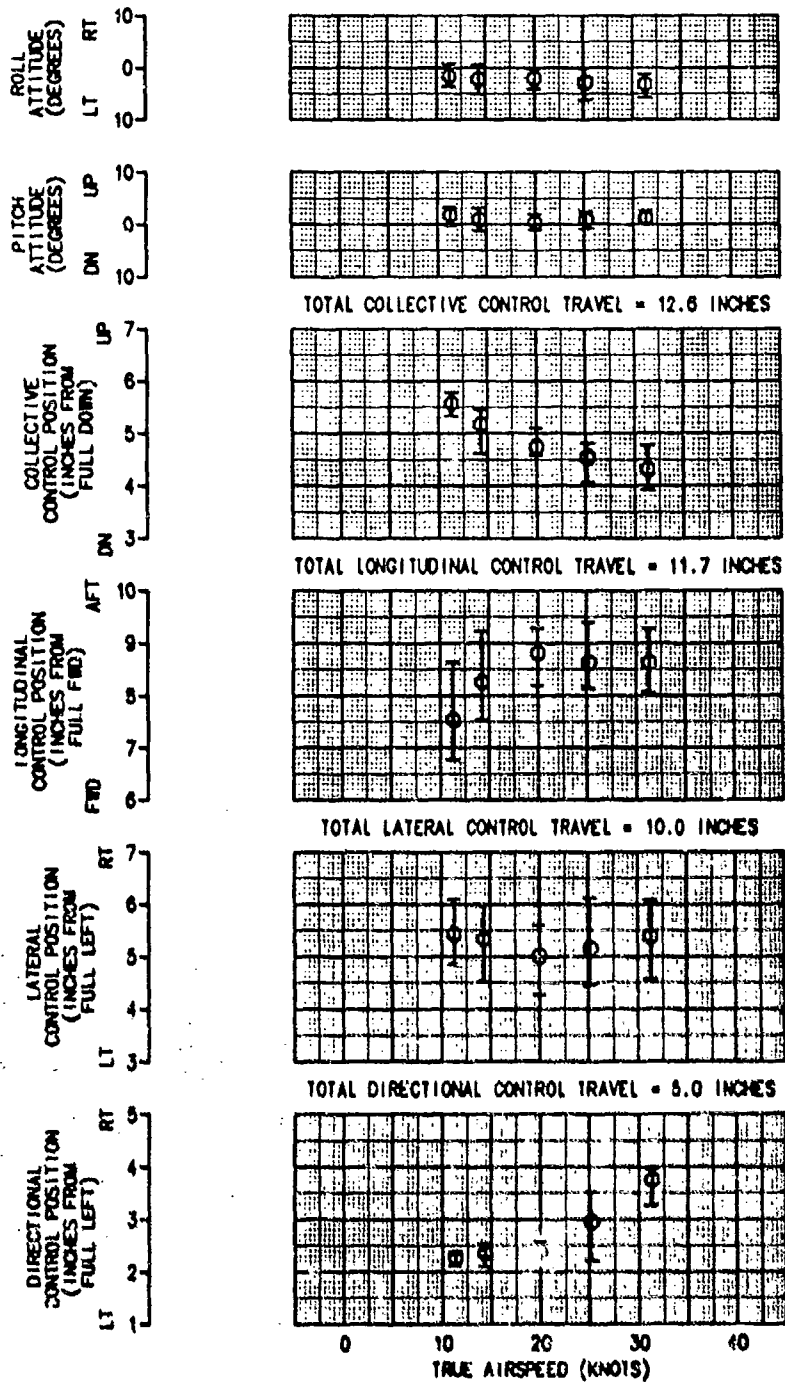


FIGURE E-171
LOW SPEED FLIGHT
225 DEGREE AZIMUTH
J0H-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG CG LOCATION LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
3050	106.8	0.0	4070	25.5	356	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 6 KNOTS OR LESS

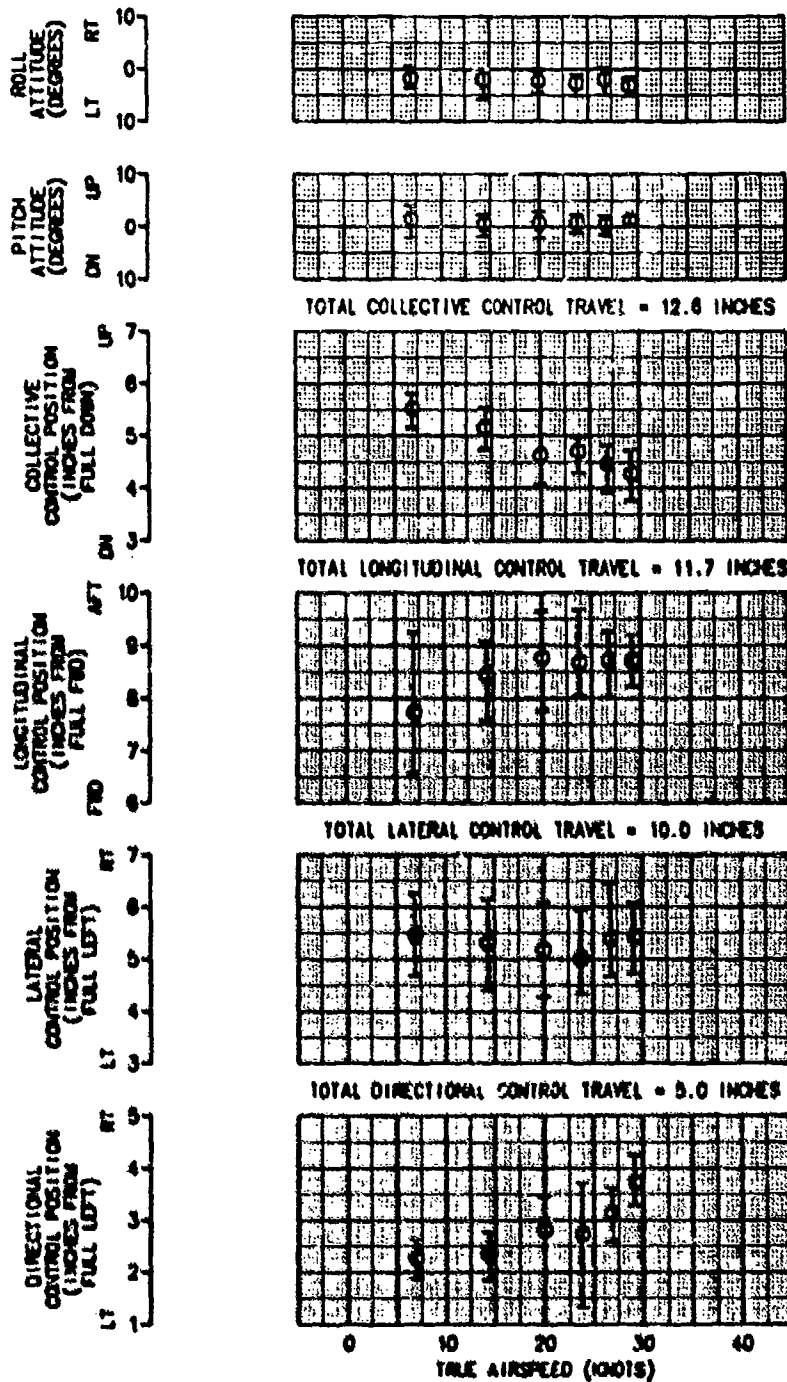


FIGURE E-172
LOW SPEED FLIGHT
240 DEGREE AZIMUTH
JHH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
2990	108.2	0.0	3500	21.0	356	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

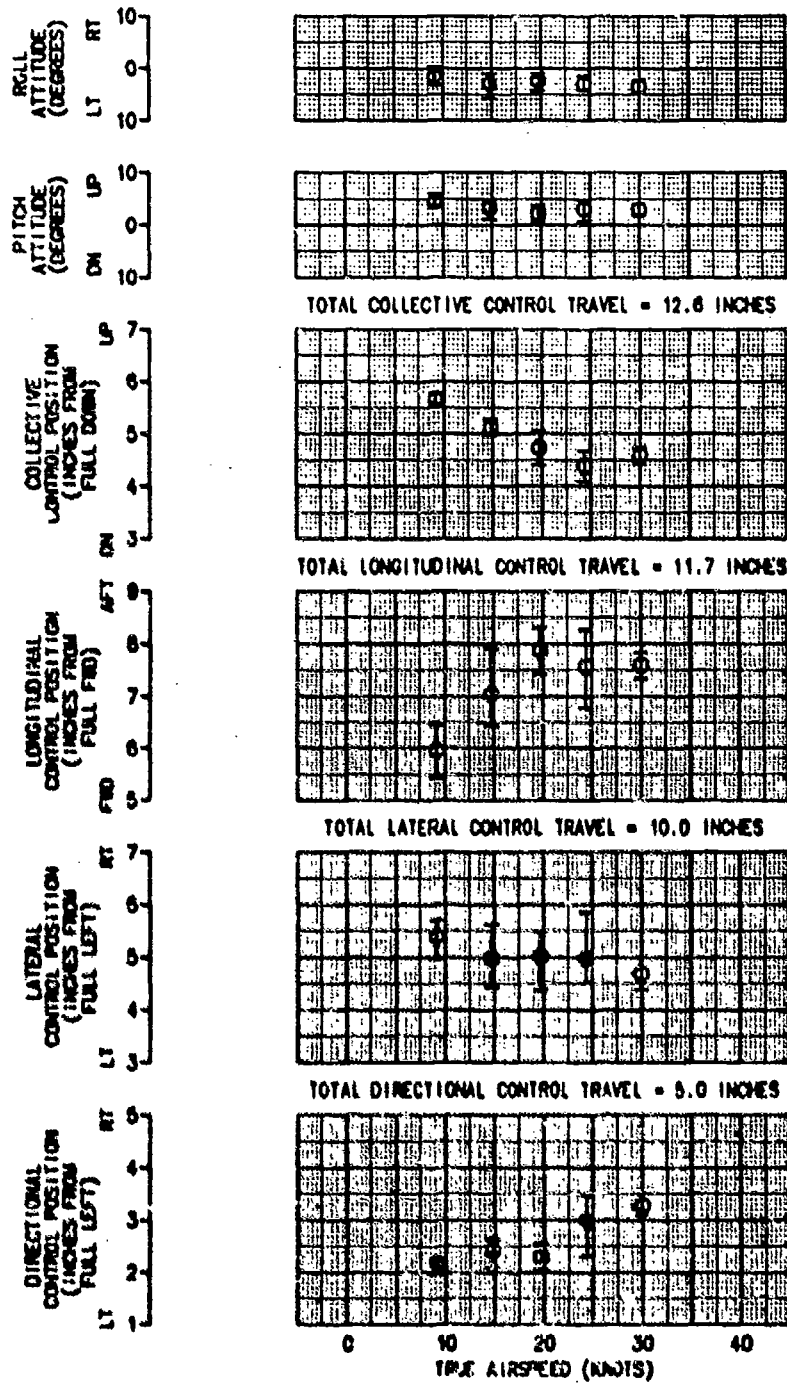


FIGURE E-173
LOW SPEED FLIGHT
240 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
2990	108.1	0.0	3510	21.0	356	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

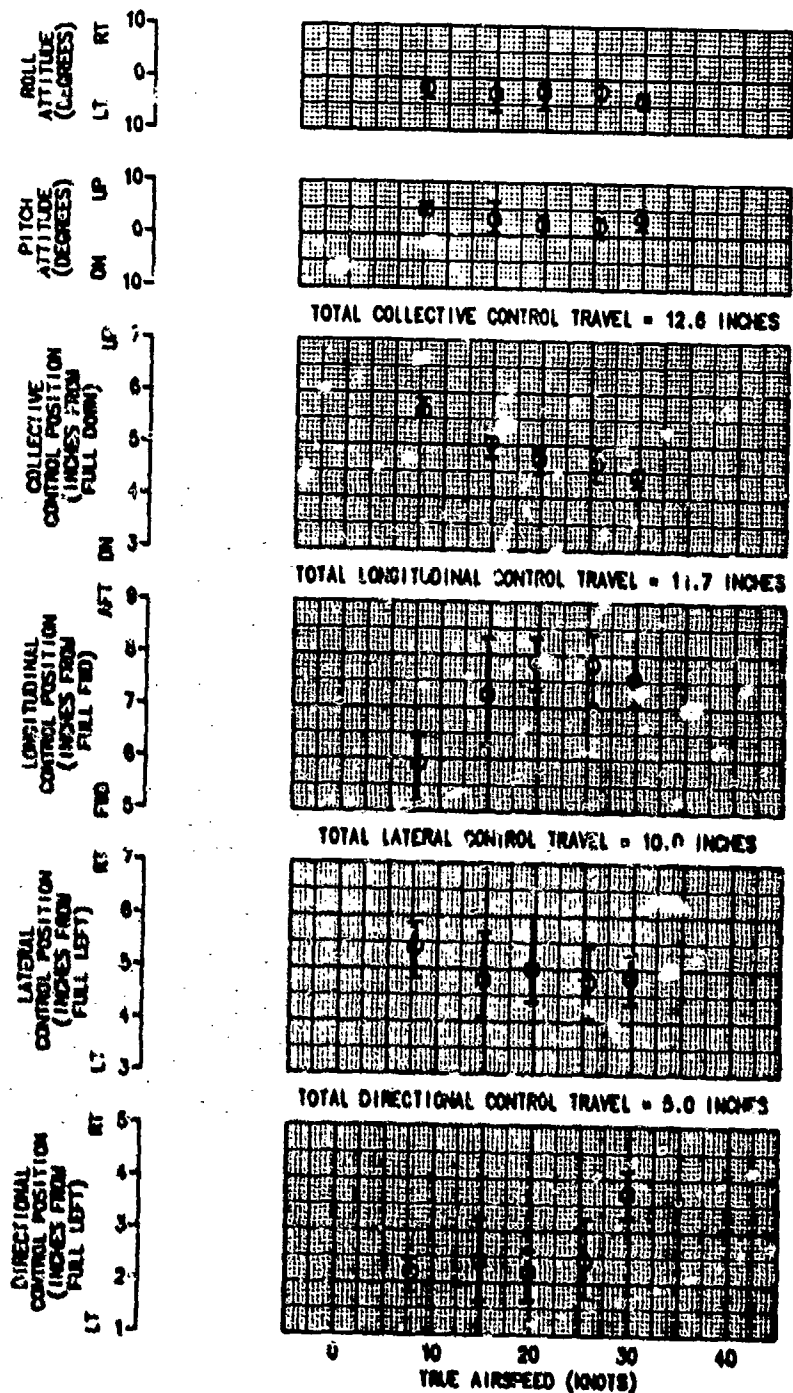


FIGURE E-174
LOW SPEED FLIGHT
280 DEGREE AZIMUTH
JOM-58C S/N 70-15348

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG CG LOCATION LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
2980	107.2	0.0	3840	22.5	357	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

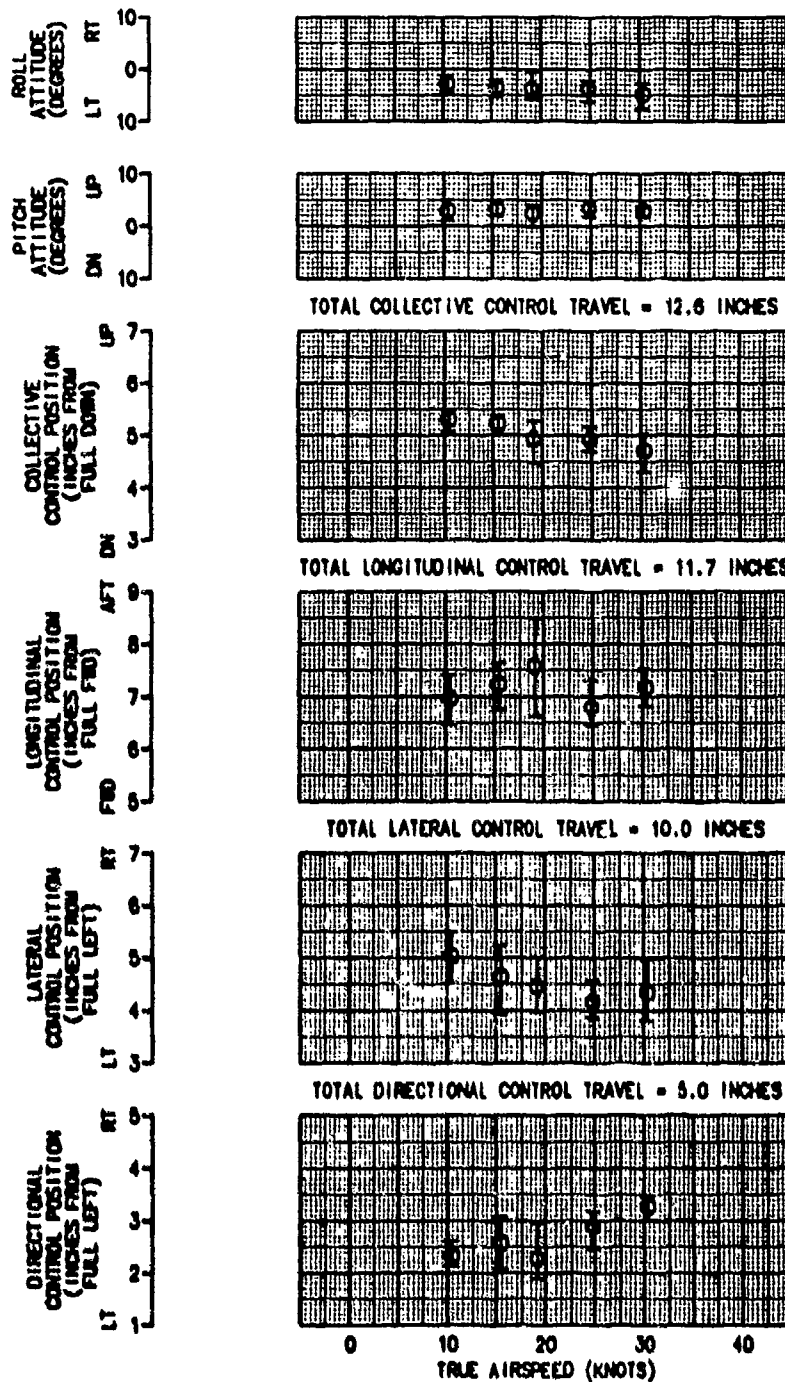


FIGURE E-175
LOW SPEED FLIGHT
280 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
LONG (FS)	LAT (BL)					
2990	107.2	0.0	3640	22.5	357	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

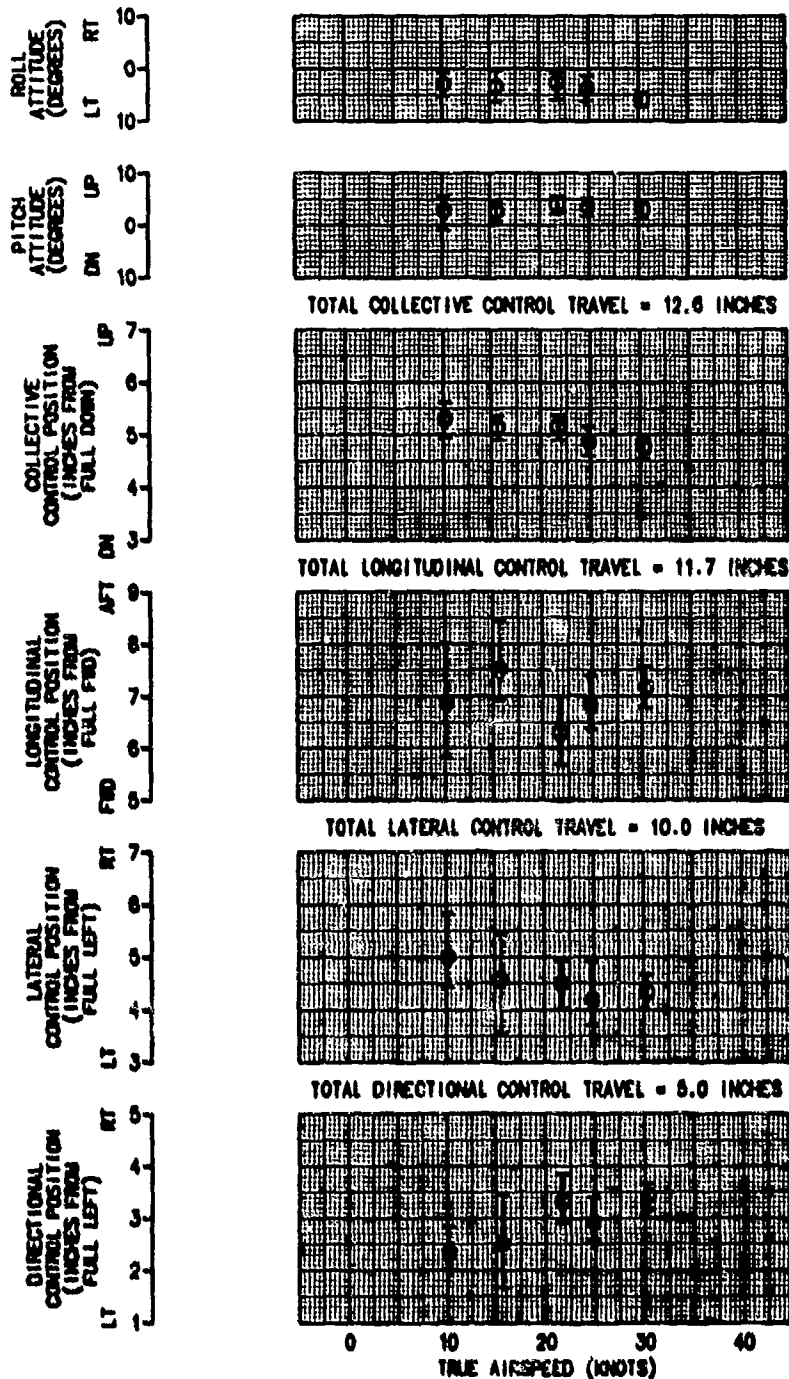
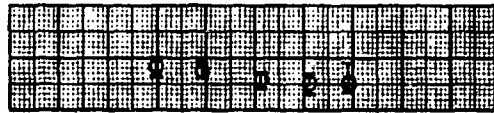


FIGURE E-176
LOW SPEED FLIGHT
290 DEGREE AZIMUTH
JOH-58C S/N 70-15349

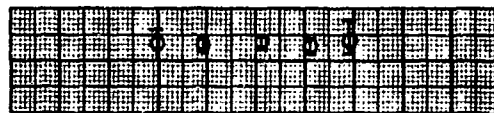
AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
3000	106.8	0.0	3630	22.5	358	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

ROLL ATTITUDE (DEGREES)
LT RT

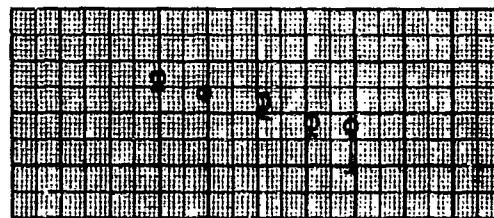


PITCH ATTITUDE (DEGREES)
DN UP



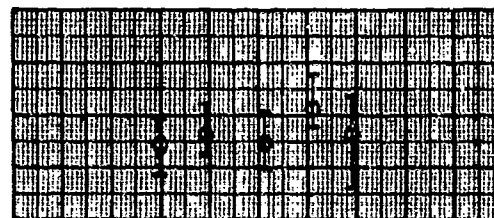
TOTAL COLLECTIVE CONTROL TRAVEL = 12.6 INCHES

COLLECTIVE CONTROL POSITION (INCHES FROM FULL DOWN)
UP



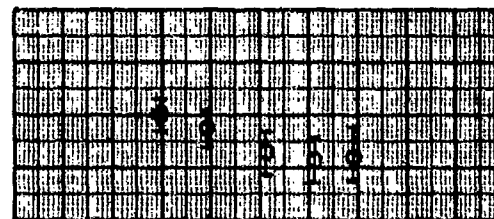
TOTAL LONGITUDINAL CONTROL TRAVEL = 11.7 INCHES

LONGITUDINAL CONTROL POSITION (INCHES FROM FULL FWD)
FWD AFT



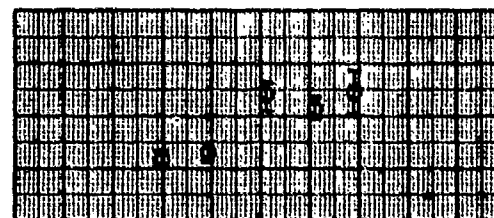
TOTAL LATERAL CONTROL TRAVEL = 10.0 INCHES

LATERAL CONTROL POSITION (INCHES FROM FULL LEFT)
LT RT



TOTAL DIRECTIONAL CONTROL TRAVEL = 5.0 INCHES

DIRECTIONAL CONTROL POSITION (INCHES FROM FULL LEFT)
LT RT



TRUE AIRSPEED (KNOTS)

FIGURE E-177
LOW SPEED FLIGHT
290 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
2990	106.8	0.0	3660	22.5	356	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

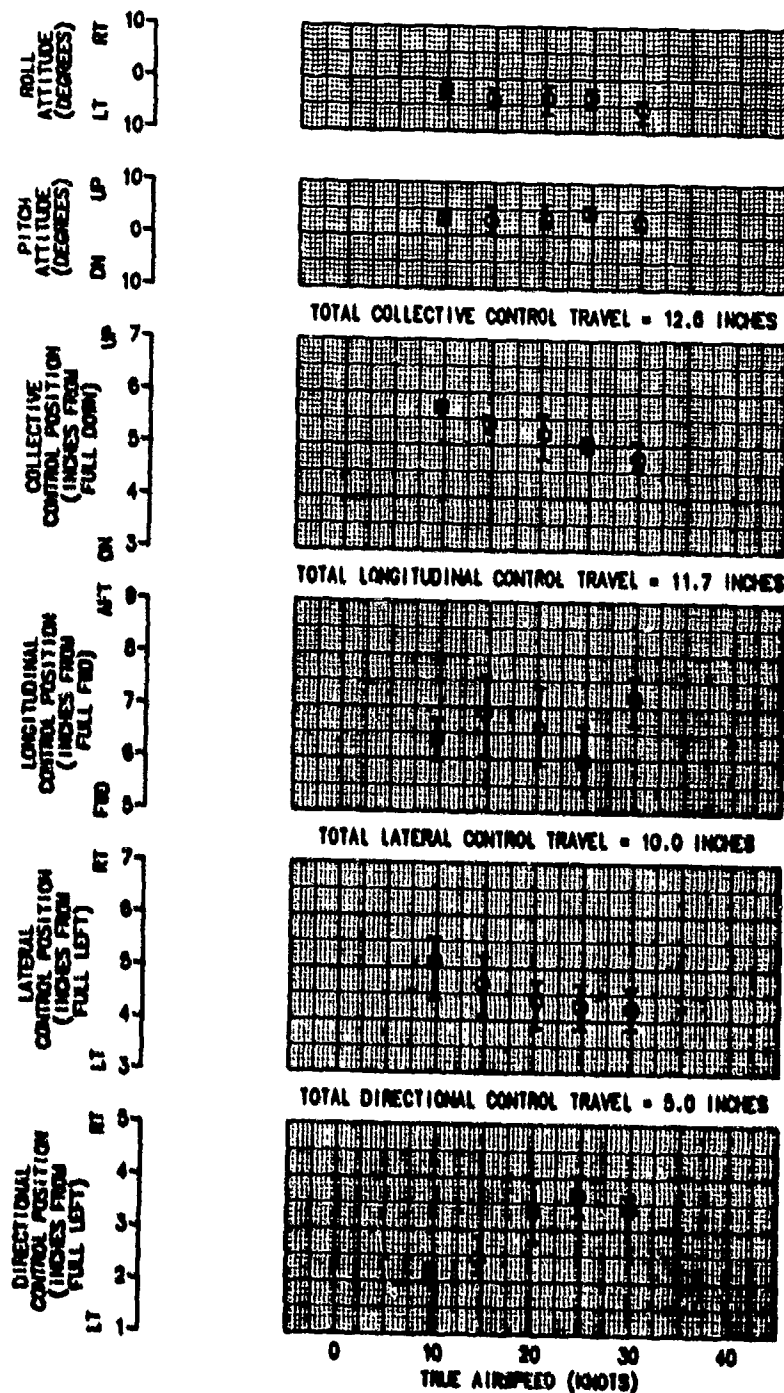


FIGURE E-178
LOW SPEED FLIGHT
300 DEGREE AZIMUTH
JOM-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
2990	106.4	0.0	3720	23.0	358	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

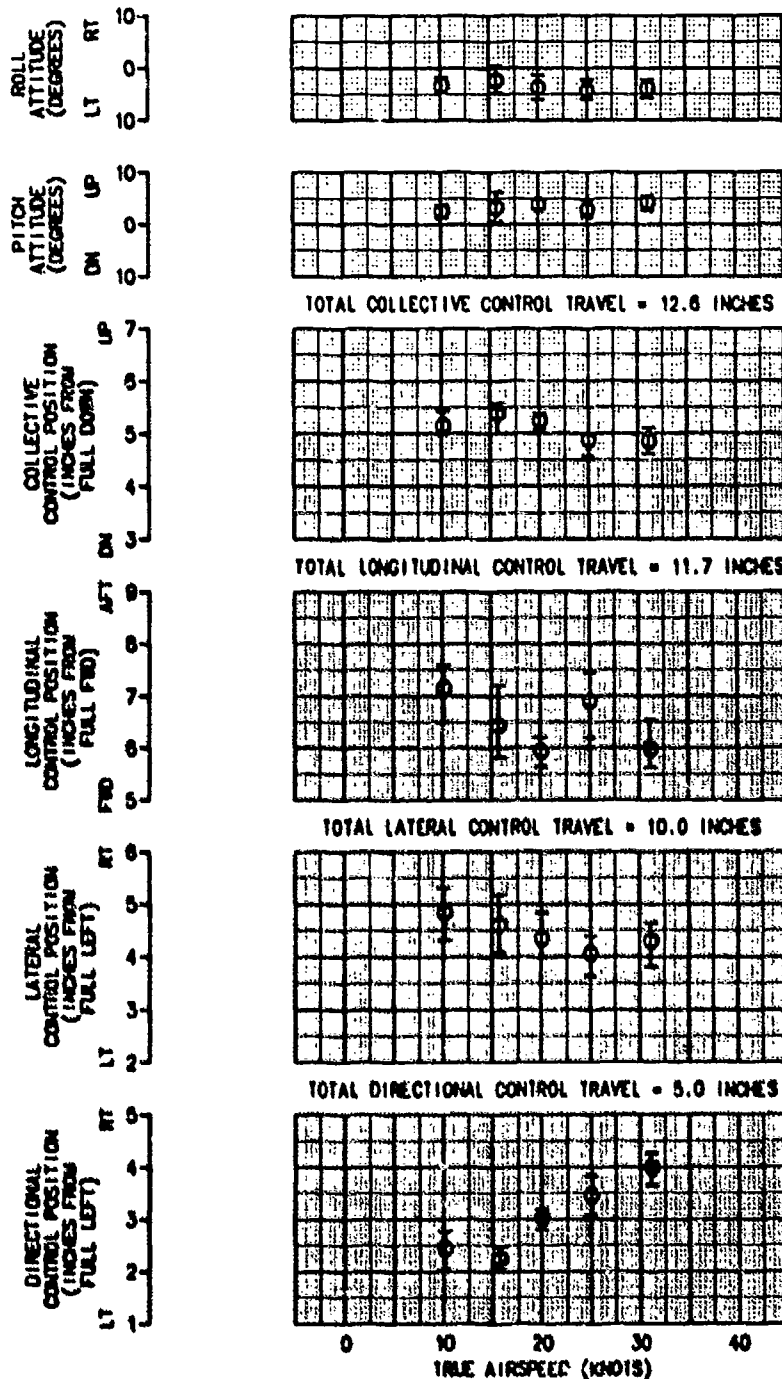


FIGURE E-179
LOW SPEED FLIGHT
300 DEGREE AZIMUTH
JQH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
LONG (FS)	LAT (BL)					
2990	106.4	0.0	3740	23.5	356	10

NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

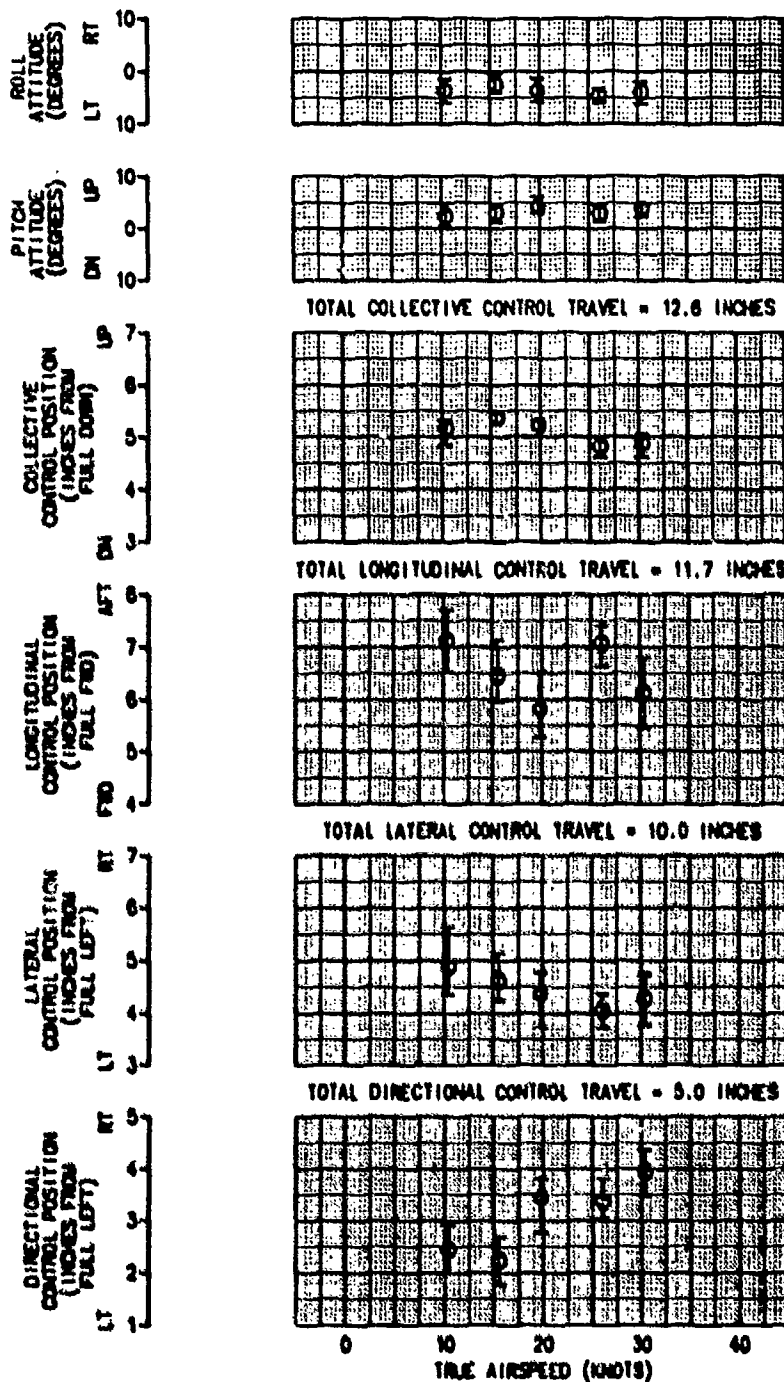


FIGURE E-180
LOW SPEED FLIGHT
310 DEGREE AZIMUTH
JOM-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
LONG (FS)	LAT (BL)					
2990	108.1	0.0	3980	24.5	351	10

NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

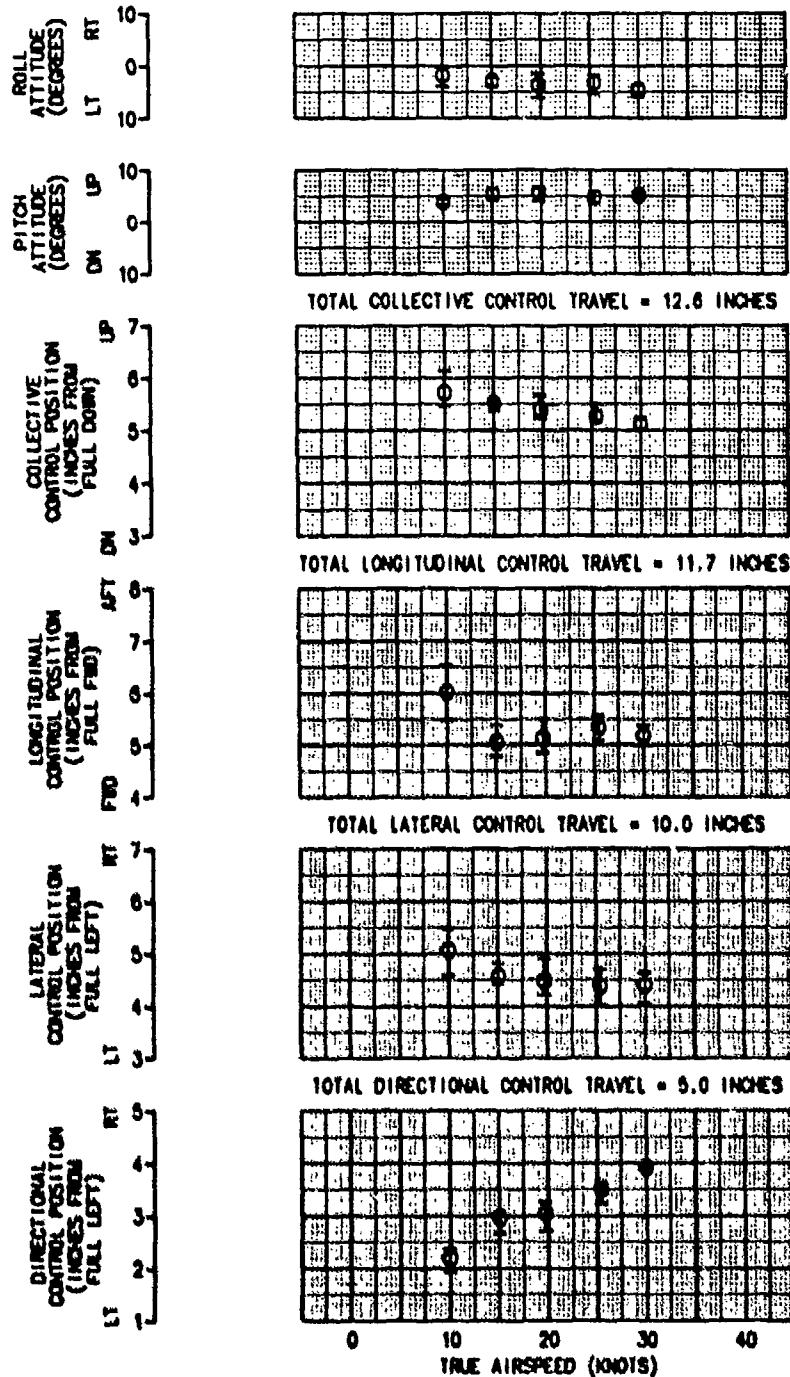


FIGURE E-181
LOW SPEED FLIGHT
310 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
2990	108.1	0.0	3950	24.5	351	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

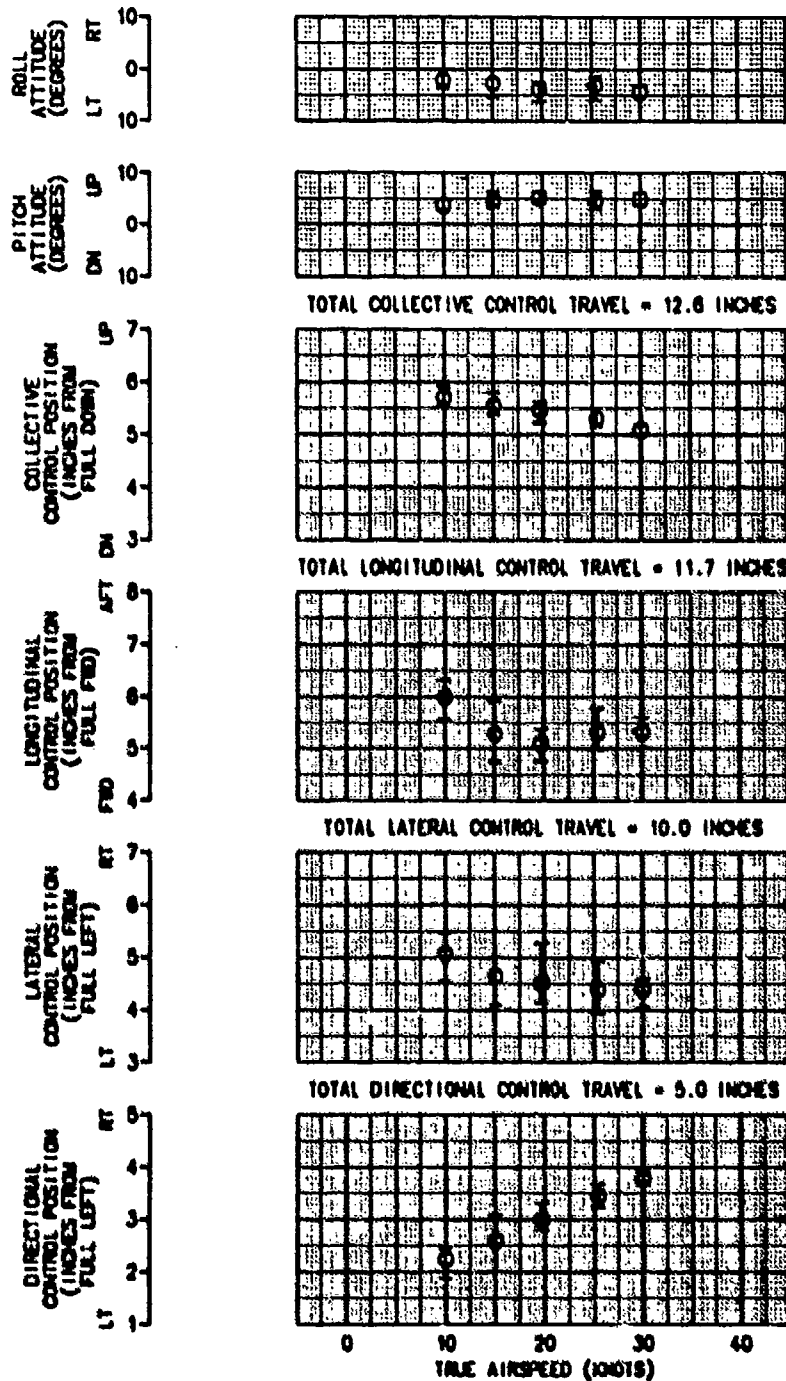


FIGURE E-182
LOW SPEED FLIGHT
320 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
2980	107.7	0.0	3980	24.5	331	10

NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

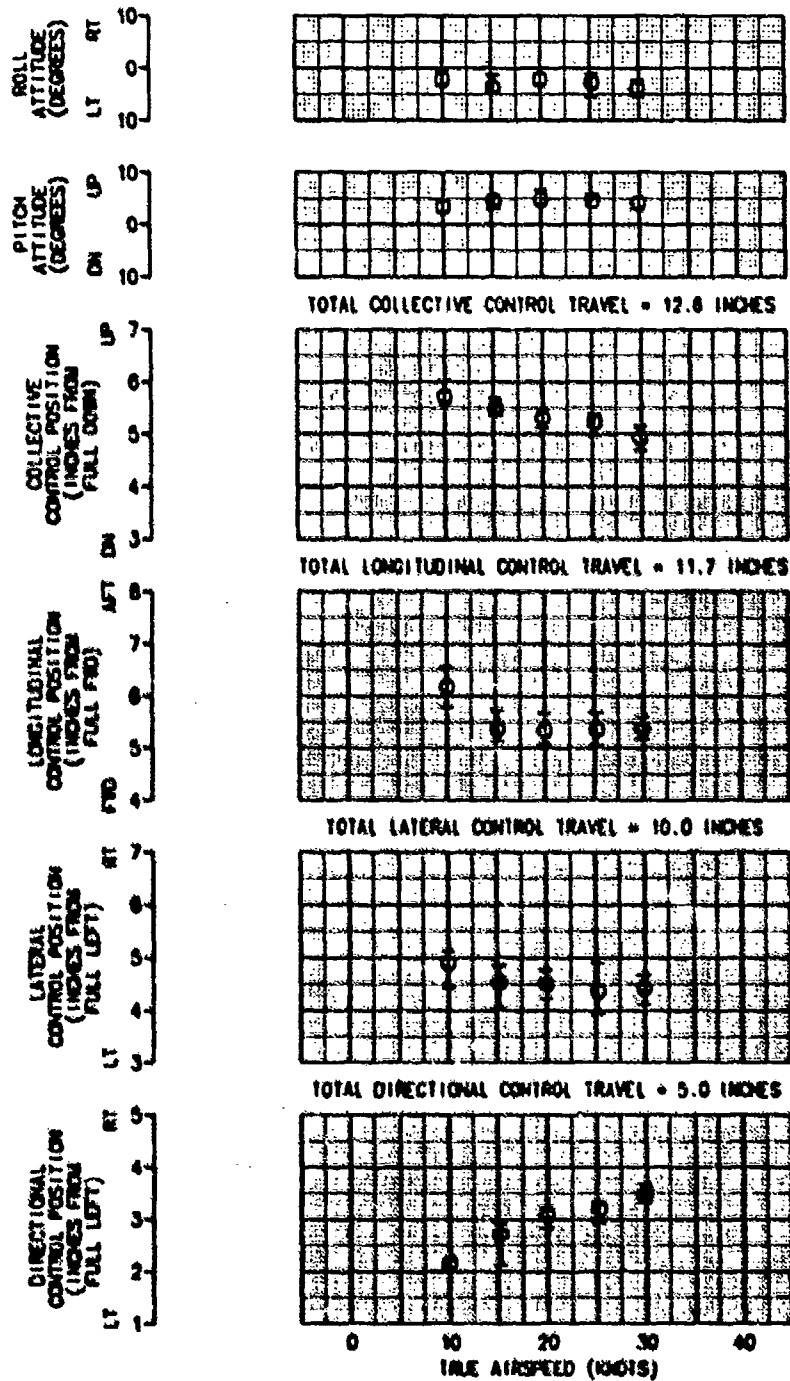


FIGURE E-183
LOW SPEED FLIGHT
320 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
2980	107.7	0.0	3980	24.5	351	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

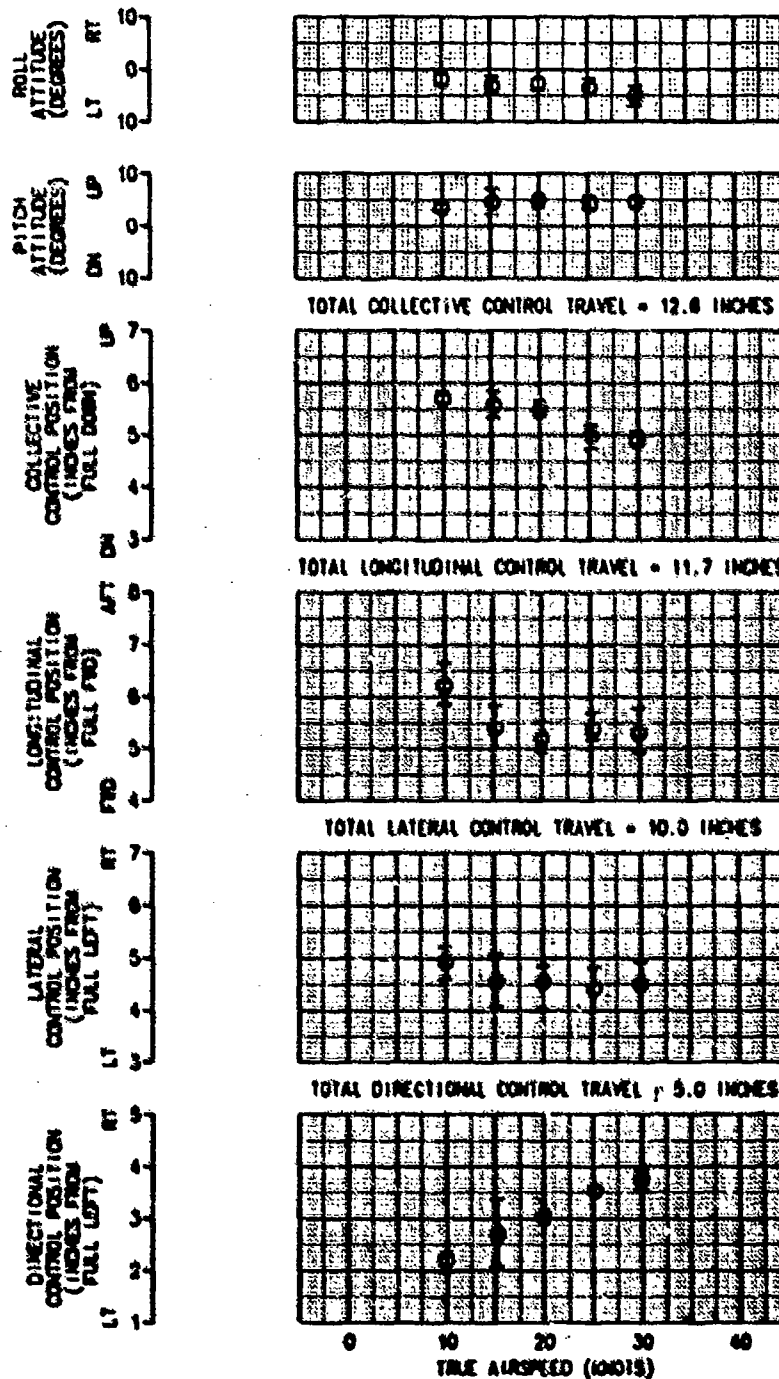


FIGURE E-184
LOW SPEED FLIGHT
330 DEGREE AZIMUTH
JOH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
3000	107.2	0.0	4050	25.5	350	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

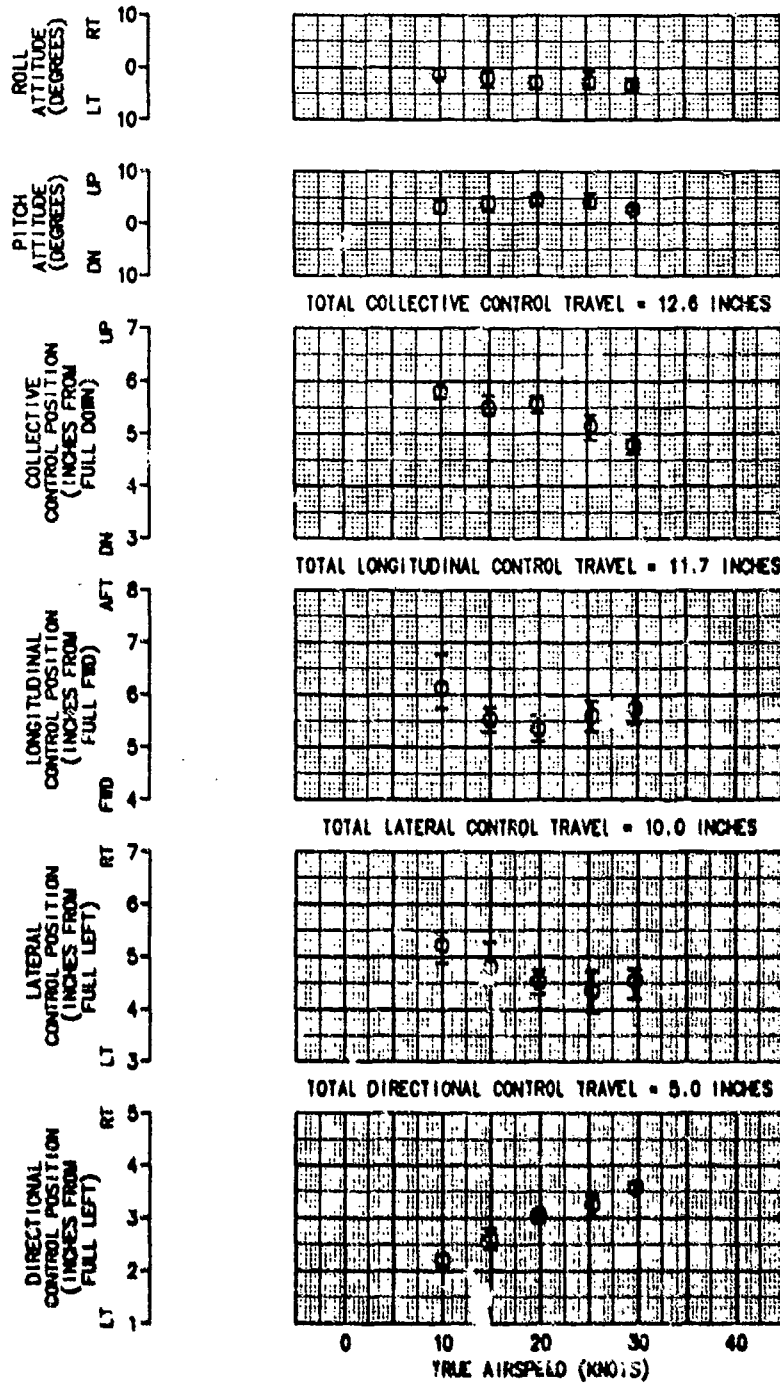


FIGURE E-185
LOW SPEED FLIGHT
330 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
3000	107.2	0.0	4050	25.5	351	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. J DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

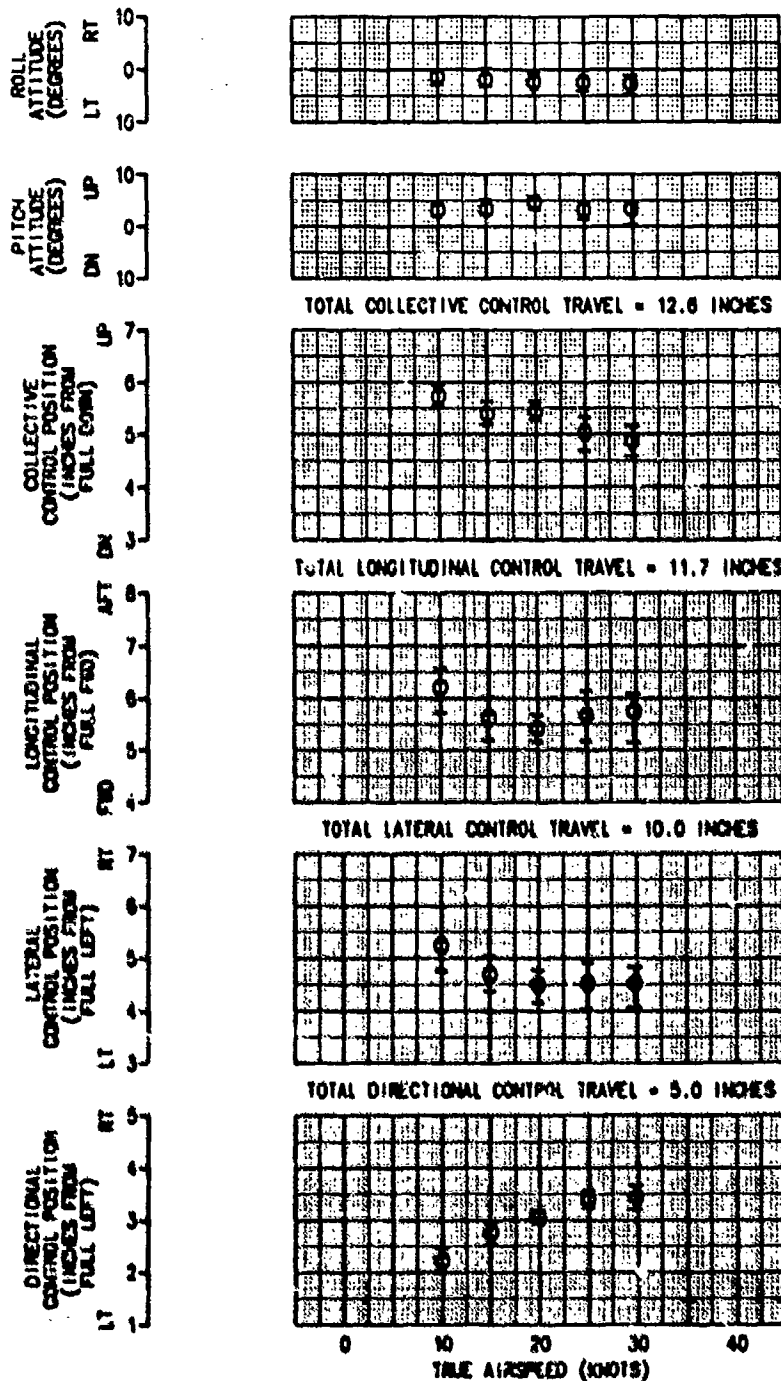
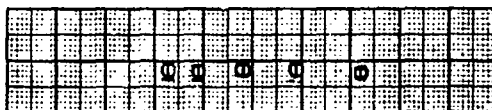


FIGURE E-186
LOW SPEED FLIGHT
340 DEGREE AZIMUTH
JCH-58C S/N 70-15349

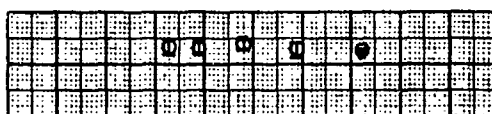
AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
2890	106.9	0.0	4100	25.5	352	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

ROLL
ATTITUDE
(DEGREES)
LT RT

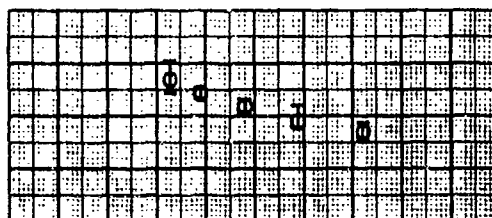


PITCH
ATTITUDE
(DEGREES)
DN UP



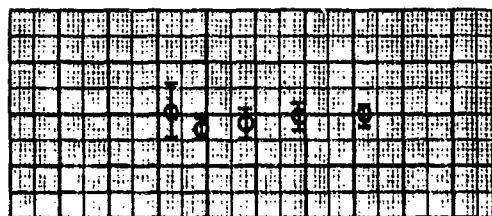
TOTAL COLLECTIVE CONTROL TRAVEL = 12.6 INCHES

COLLECTIVE
CONTROL POSITION
(INCHES FROM
FULL DOWN)
DN UP



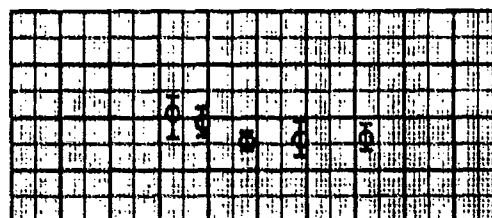
TOTAL LONGITUDINAL CONTROL TRAVEL = 11.7 INCHES

LONGITUDINAL
CONTROL POSITION
(INCHES FROM
FULL FWD)
FWD AFT



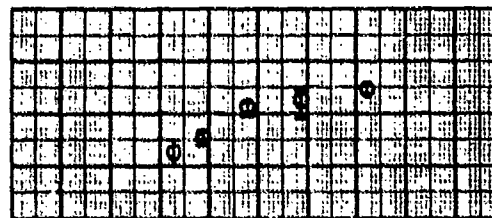
TOTAL LATERAL CONTROL TRAVEL = 10.0 INCHES

LATERAL
CONTROL POSITION
(INCHES FROM
FULL LEFT)
LT RT



TOTAL DIRECTIONAL CONTROL TRAVEL = 5.0 INCHES

DIRECTIONAL
CONTROL POSITION
(INCHES FROM
FULL LEFT)
LT RT



0 10 20 30 40
TRUE AIRSPEED (KNOTS)

FIGURE E-187
LOW SPEED FLIGHT
340 DEGREE AZIMUTH
J04-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
2990	106.9	0.0	4090	25.5	352	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

ROLL ATTITUDE (DEGREES)
RT
LT

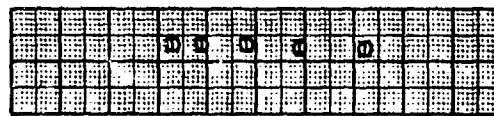
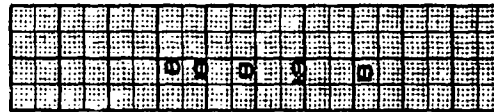
PITCH ATTITUDE (DEGREES)
UP
DN

COLLECTIVE CONTROL POSITION (INCHES FROM FULL DOWN)
UP
DN

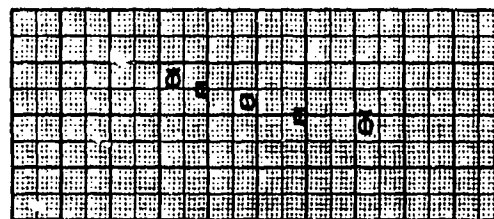
LONGITUDINAL CONTROL POSITION (INCHES FROM FULL FWD)
AFT
FWD

LATERAL CONTROL POSITION (INCHES FROM FULL LEFT)
RT
LT

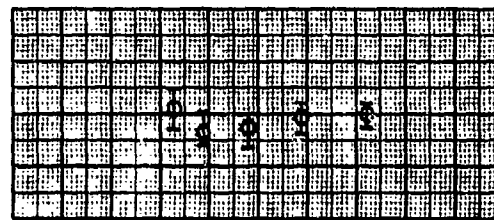
DIRECTIONAL CONTROL POSITION (INCHES FROM FULL LEFT)
RT
LT



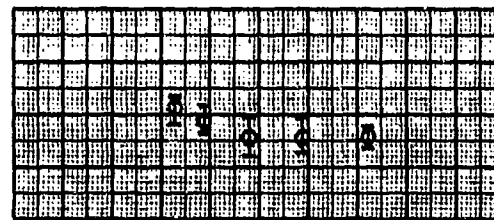
TOTAL COLLECTIVE CONTROL TRAVEL = 12.6 INCHES



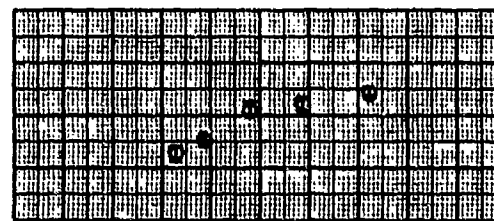
TOTAL LONGITUDINAL CONTROL TRAVEL = 11.7 INCHES



TOTAL LATERAL CONTROL TRAVEL = 10.0 INCHES



TOTAL DIRECTIONAL CONTROL TRAVEL = 5.0 INCHES



0 10 20 30 40
TRUE AIRSPEED (KNOTS)

FIGURE E-188
LOW SPEED FLIGHT
350 DEGREE AZIMUTH
JQH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG CG LOCATION LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
2980	108.7	0.0	4120	26.0	353	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

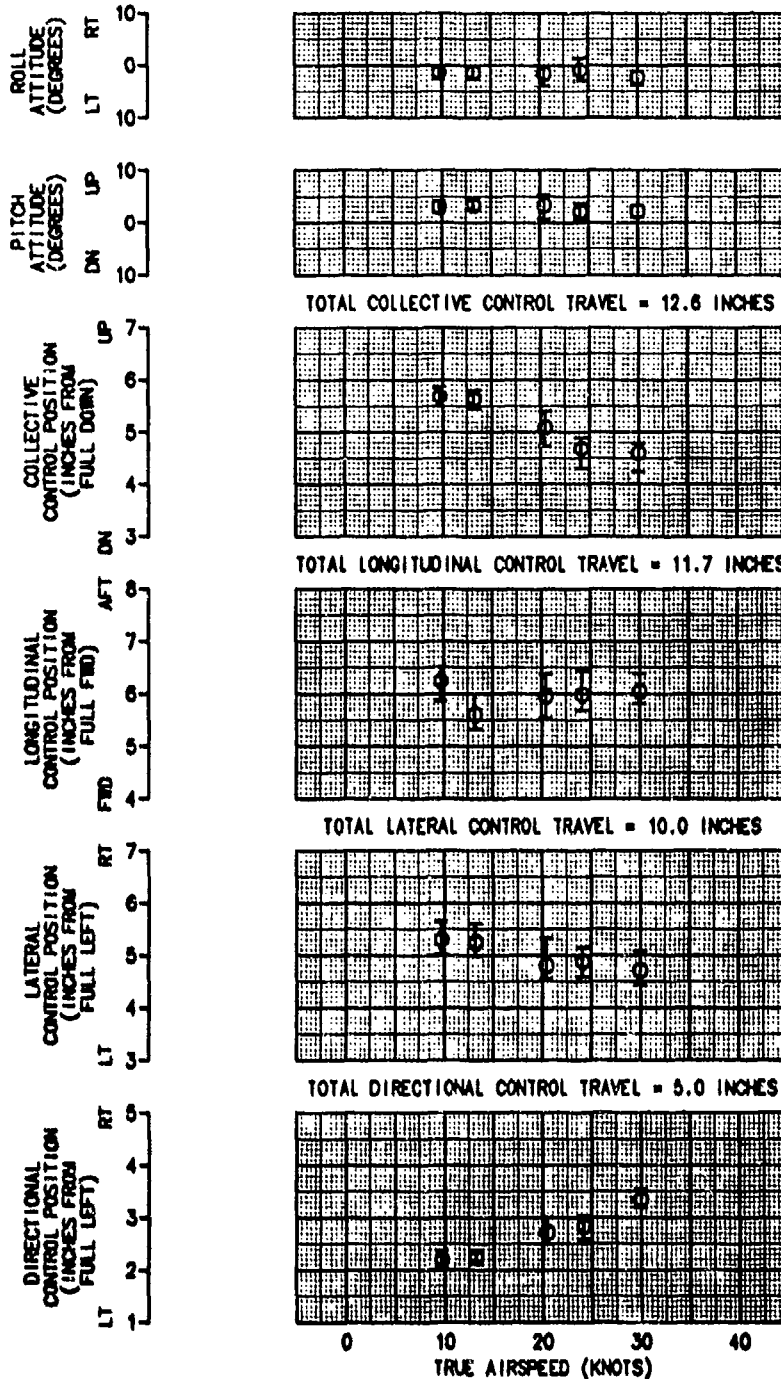


FIGURE E-189
LOW SPEED FLIGHT
350 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
LONG (FS)	LAT (BL)					
2960	106.7	0.0	4120	26.0	353	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS ON, SAS OFF
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

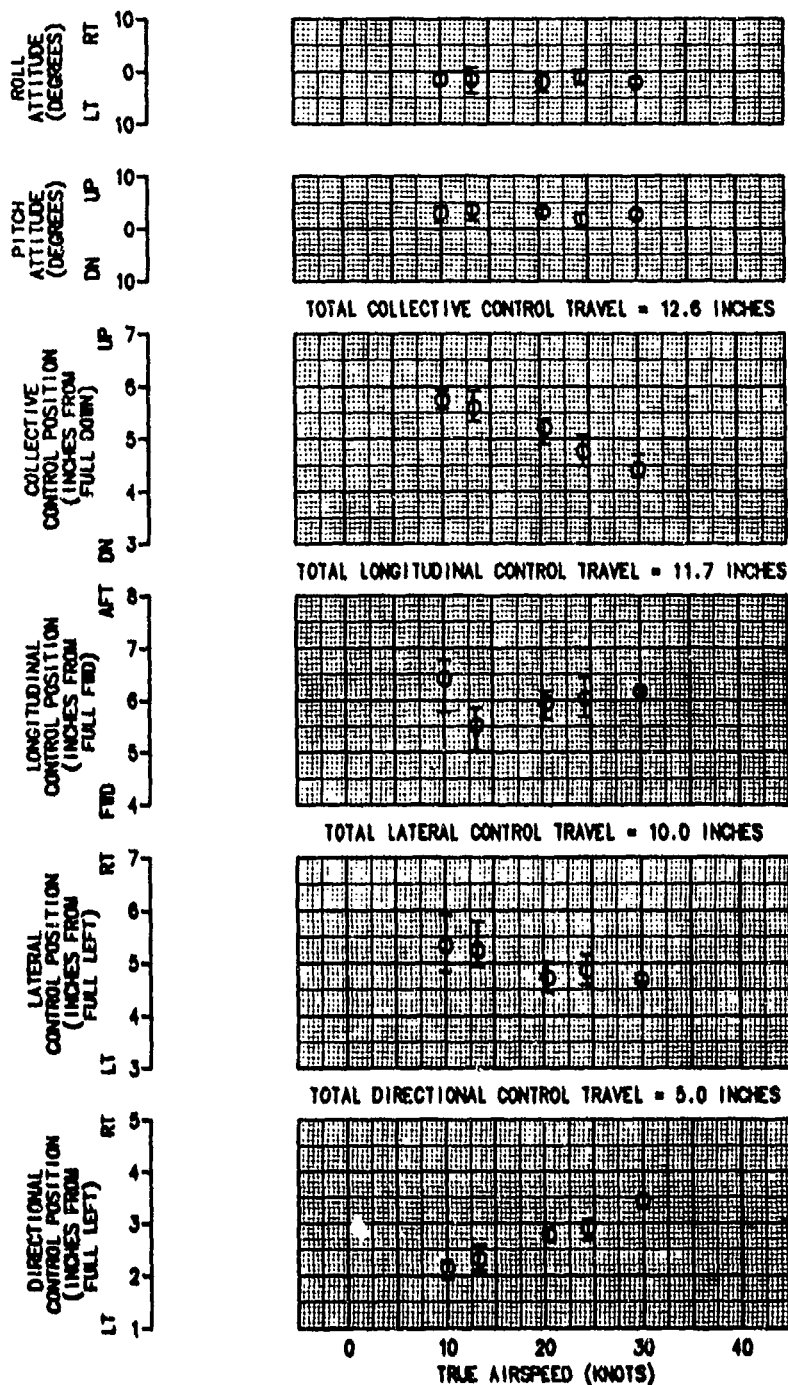


FIGURE E-190
LOW SPEED FLIGHT
120 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
2950	107.9	0.0	3760	22.5	352	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS OFF, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

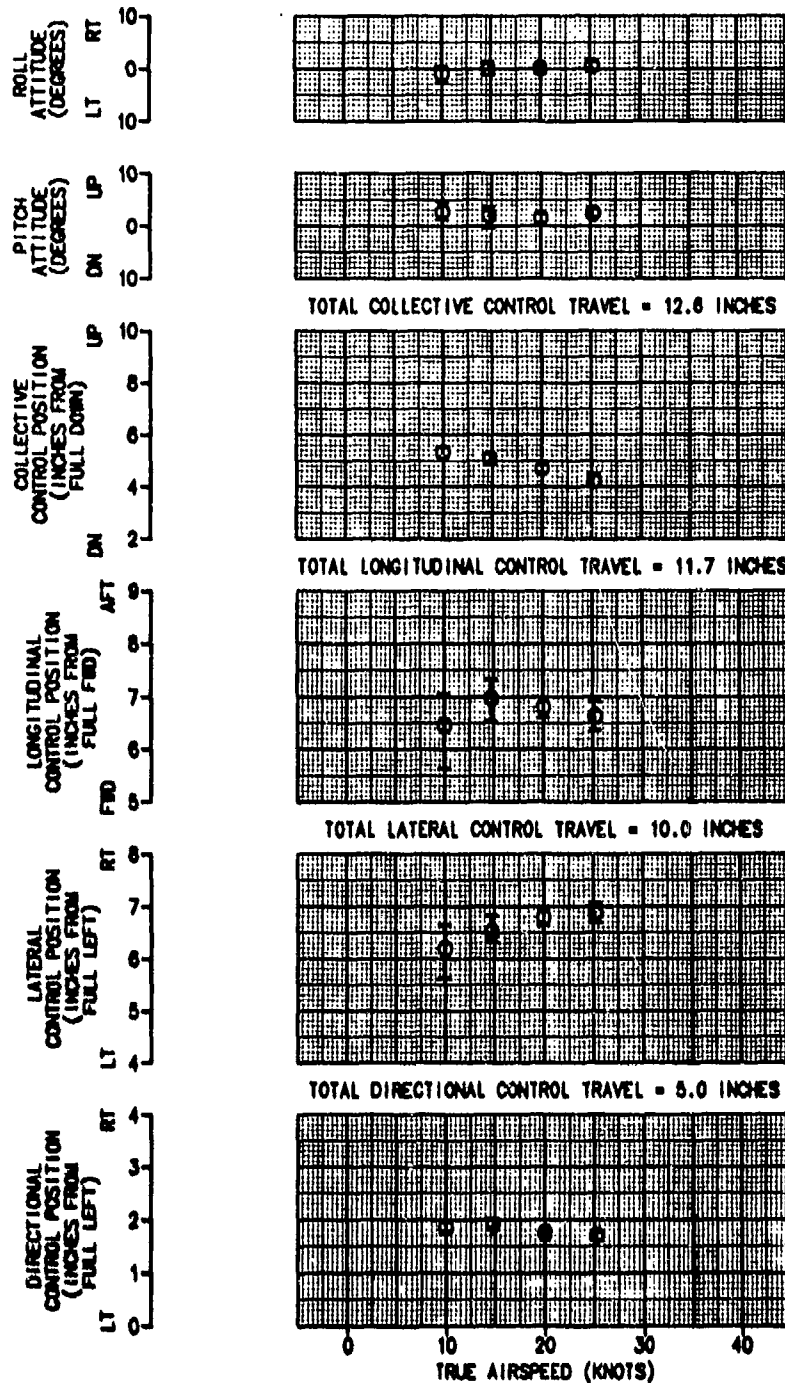


FIGURE E-191
LOW SPEED FLIGHT
180 DEGREE AZIMUTH
JCH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
2940	107.8	0.0	3900	24.0	353	10

- NOTES: 1. CONFIGURATION: CLEAN, DOORS OFF, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

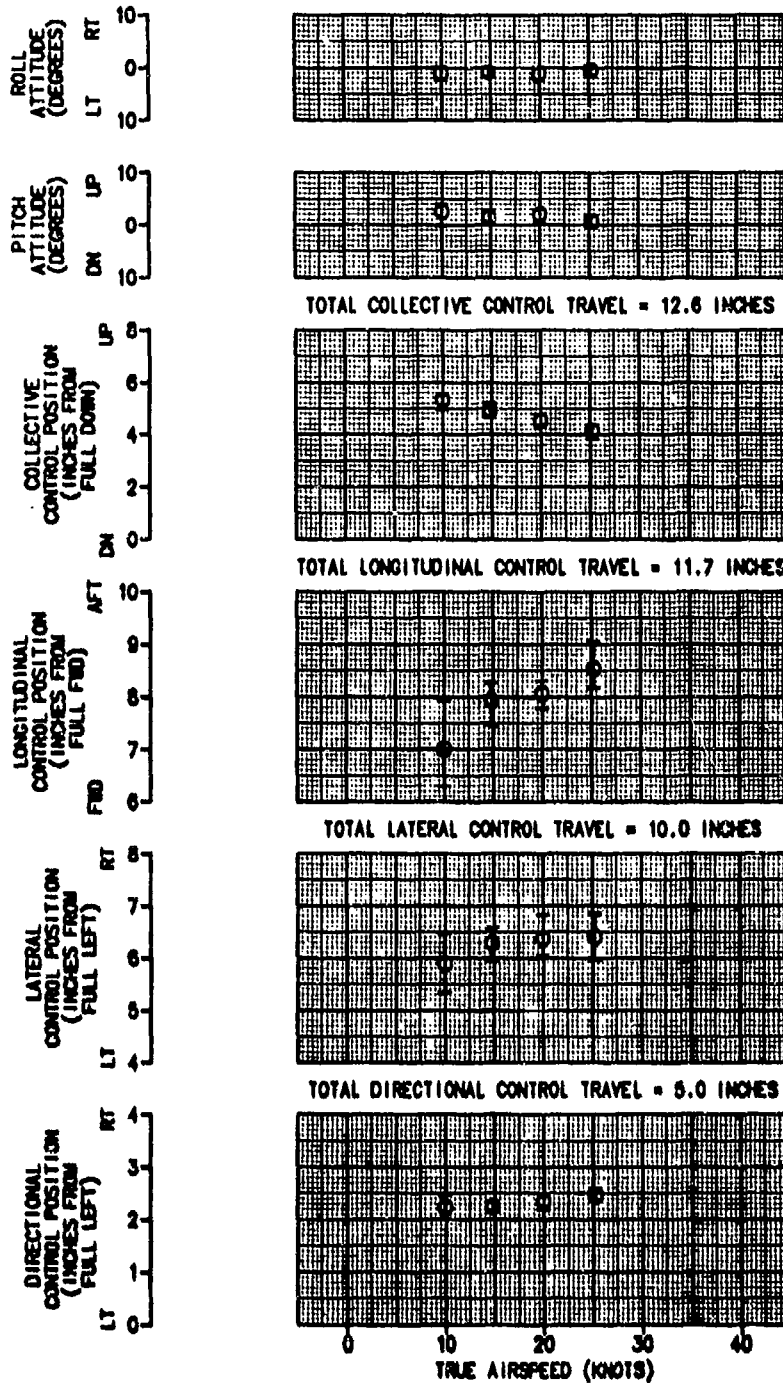


FIGURE E-192
LOW SPEED FLIGHT
240 DEGREE AZIMUTH
JHH-58C S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION		AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	SKID HEIGHT (FT)
	LONG (FS)	LAT (BL)				
2950	107.4	0.0	3960	24.5	356	10

NOTES: 1. CONFIGURATION: CLEAN, DOORS OFF, SAS ON
2. I DENOTES CONTROL AND ATTITUDE EXCURSIONS
3. WIND CONDITIONS: 5 KNOTS OR LESS

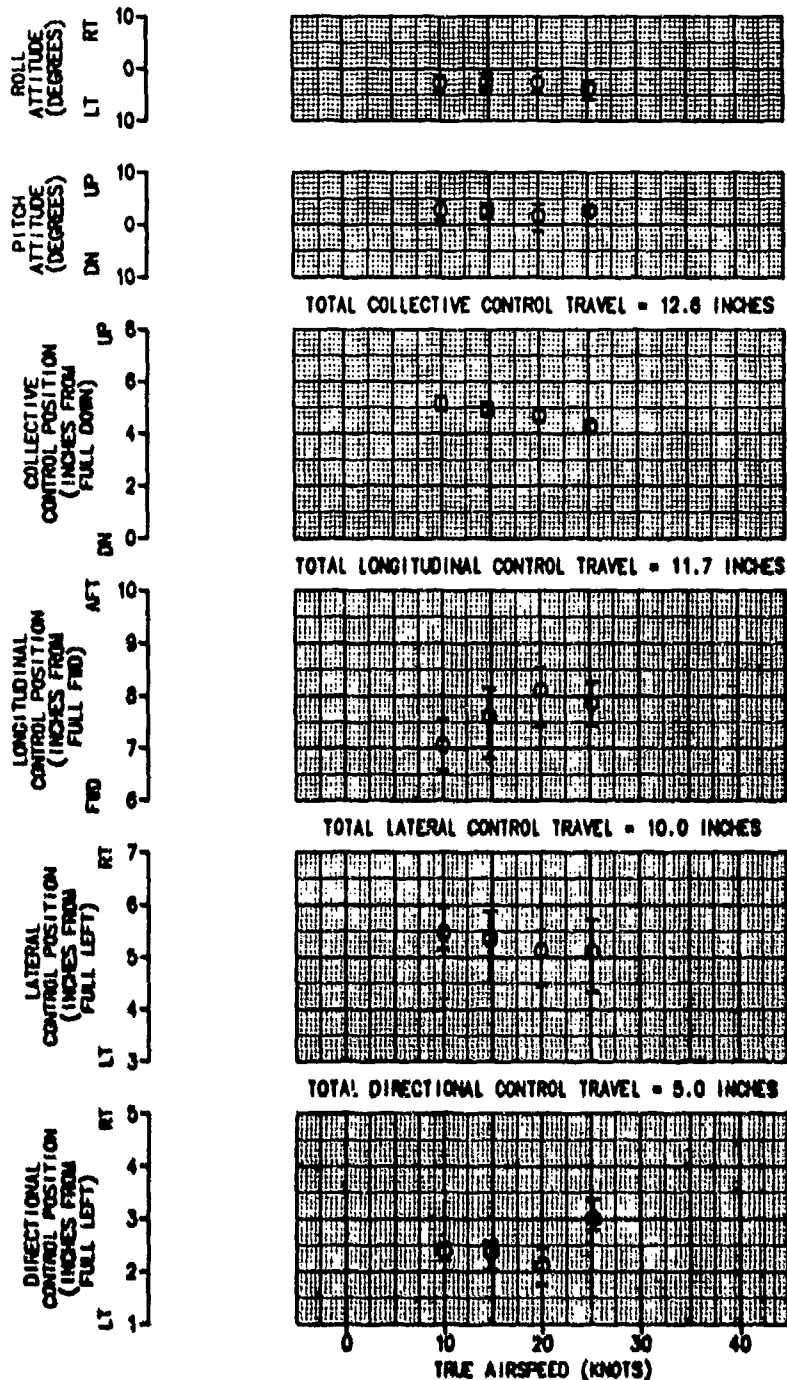


FIGURE E-193
LOW SPEED FLIGHT - LEFT YAW RATE

JOH-58C USA S/N 70-15349
AVG CROSS WEIGHT (LB) 2710
AVG CG LONG (FS) 111.3
AVG LOCATION LAT (BL) 0.7 RT
AVG DENSITY OAT (DEG C) 13.0
TRIM ROTOR SPEED (RPM) 355
TRUE AIRSPEED (KNOTS) 6
STABILITY AUGMENTATION SYSTEM ON

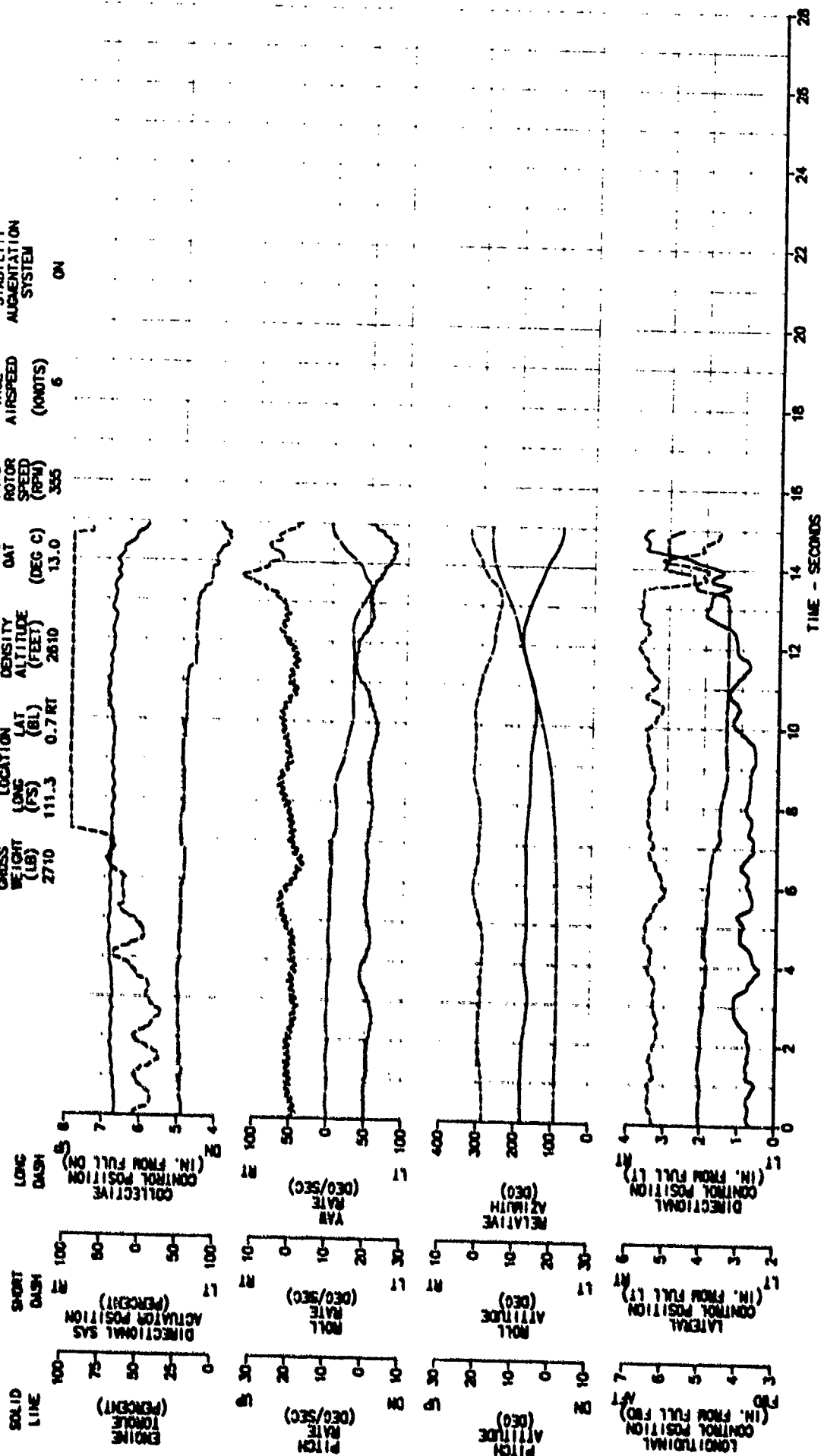


FIGURE E-194
LOW SPEED FLIGHT - LEFT YAW RATE

JOH-58C USA S/N 70-15349
 TRUE AIRSPEED (KNOTS) 5
 STABILITY AUGMENTATION SYSTEM OFF
 TRIM ROTOR SPEED (RPM) 357
 AVG OAT (DEG C) 12.5
 AVG DENSITY ALTITUDE (FEET) 2570
 AVG CG LONG (FS) 111.3 0.7 RT
 AVG CG LAT (BL)
 GROSS WEIGHT (LB) 2700

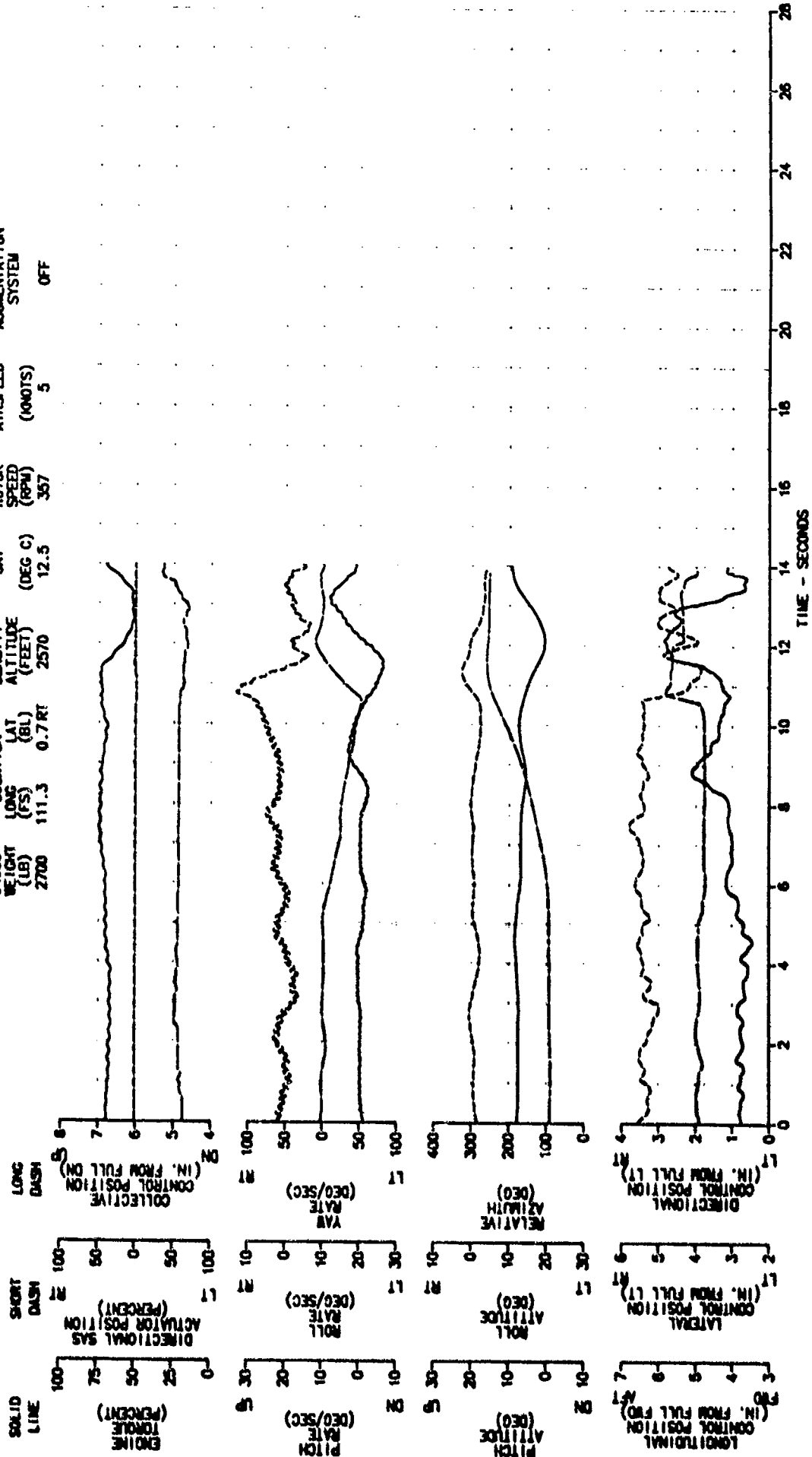


FIGURE E-195
LOW SPEED FLIGHT-RIGHT YAW RATE

JOM-506 USA S/N 70-15349
AVG CG WEIGHT (LB) 2670
AVG CG LONG (FS) 190.7
AVG CG LAT (BL) 0.5 RT
AVG DENSITY 34.5 (DEG C)
TRIM ROTOR SPEED (RPM) 354
TRUE AIRSPEED (KNOTS) 12
STABILITY AUGMENTATION SYSTEM ON

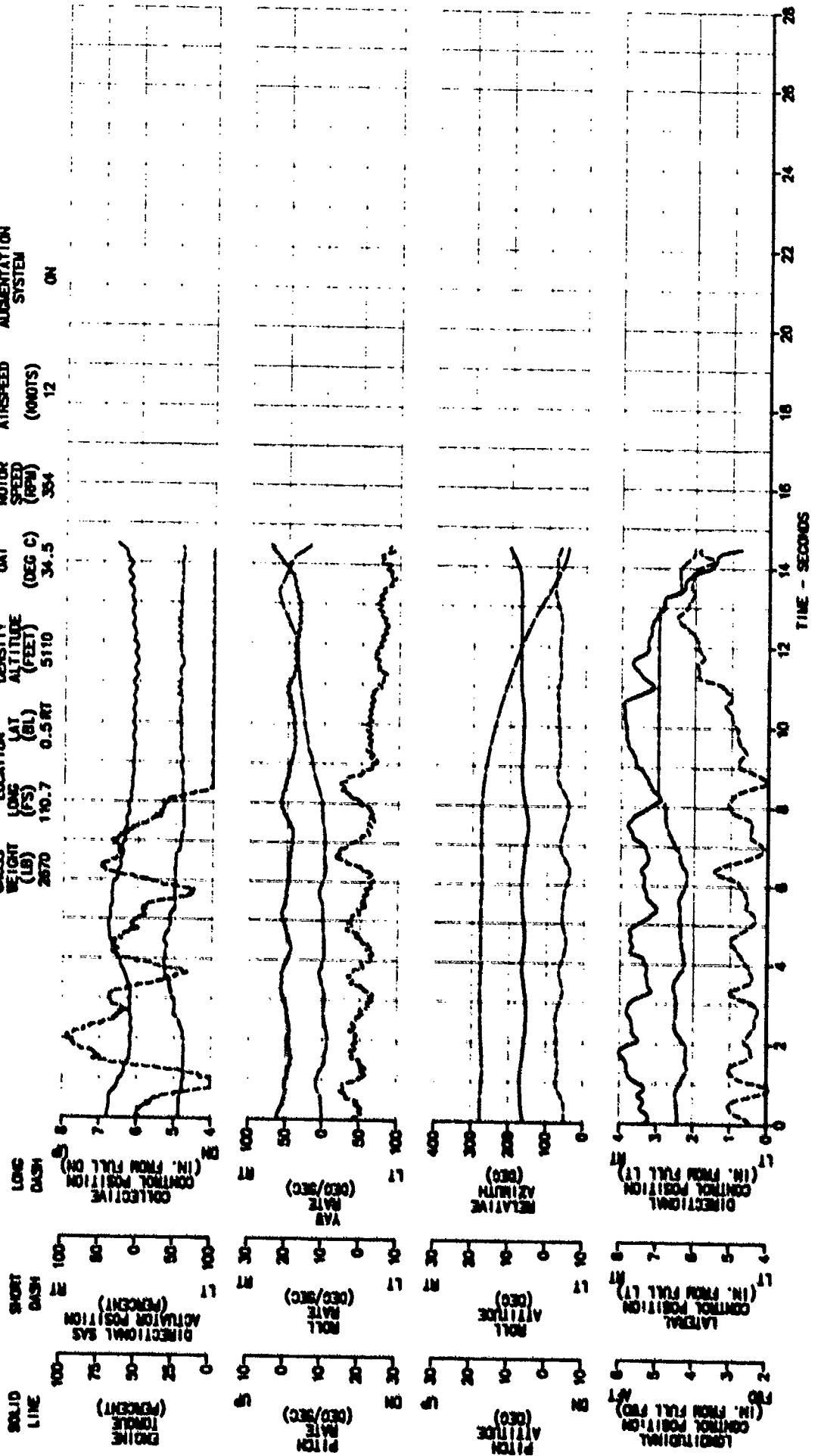


FIGURE E-196
LOW SPEED FLIGHT-RIGHT YAW RATE

JOH-58C USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM
OFF

TRUE
AIRSPEED
(KNOTS) 10

TRIM
MOTOR
SPEED
(RPM) 357

AVG
DENSITY
ALTITUDE
(FEET) 5180

AVG
OAT
(DEG C) 35.0

AVG CG
LOCATION
LAT
(ML) 0.5 RT

AVG
LONG
(FS) 190.7

AVG
WEIGHT
(LB) 2850

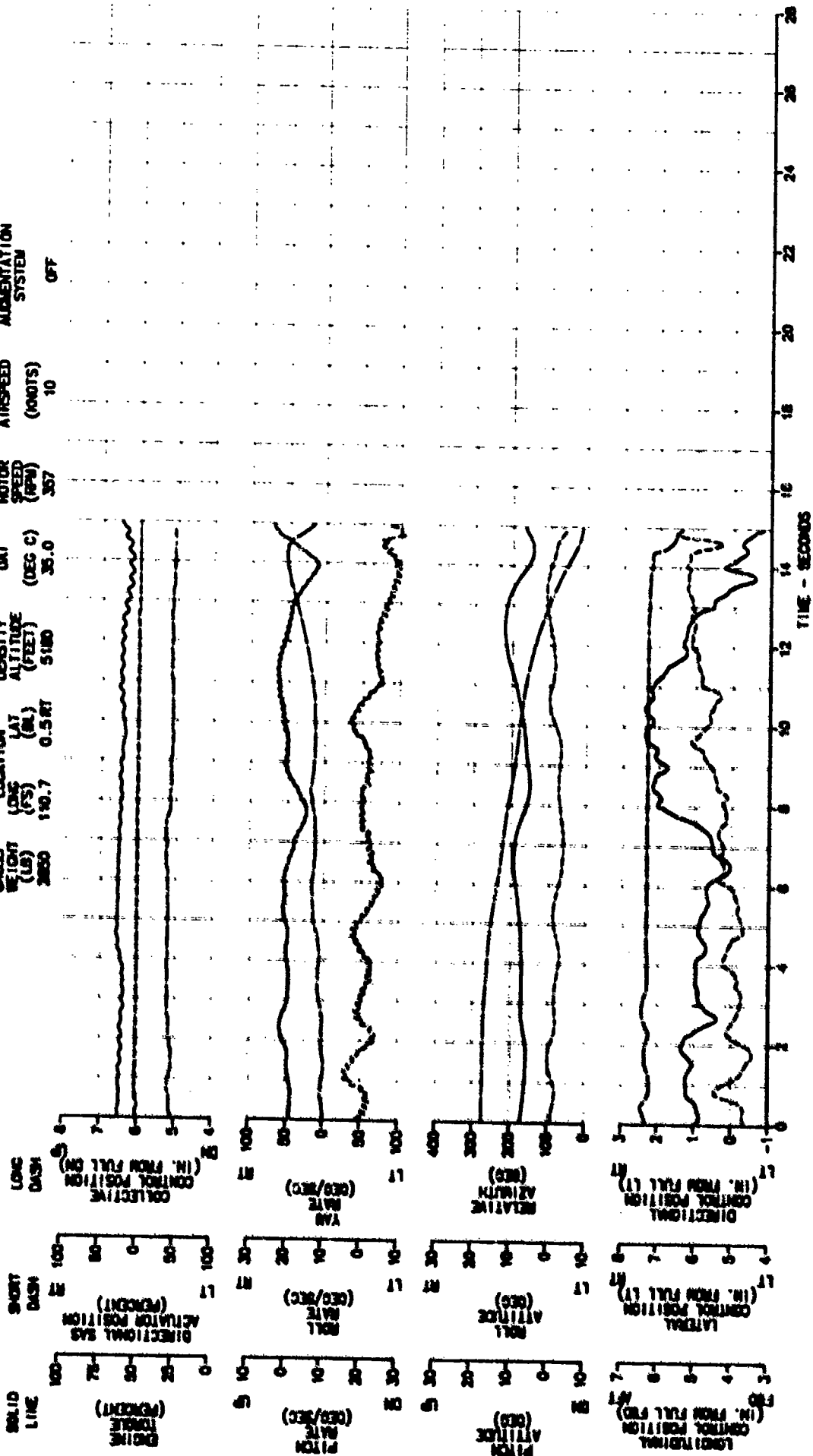


FIGURE E-187
LOW SPEED FLIGHT - LEFT YAW RATE

STABILITY
AUGMENTATION
SYSTEM
ON

TRUE
AIRSPEED
(KNOTS)
15

TRIM
ROTOR
SPEED
(RPM)
306

AVC
QAT
(DEG C)
14.0

AVC
DENSITY
ALTITUDE
(FEET)
2720

AVC
LOCATION
(LAT
(N)
(LONG
(E)
110.8 0.5 RT

AVC
GROSS
WEIGHT
(LB)
2730

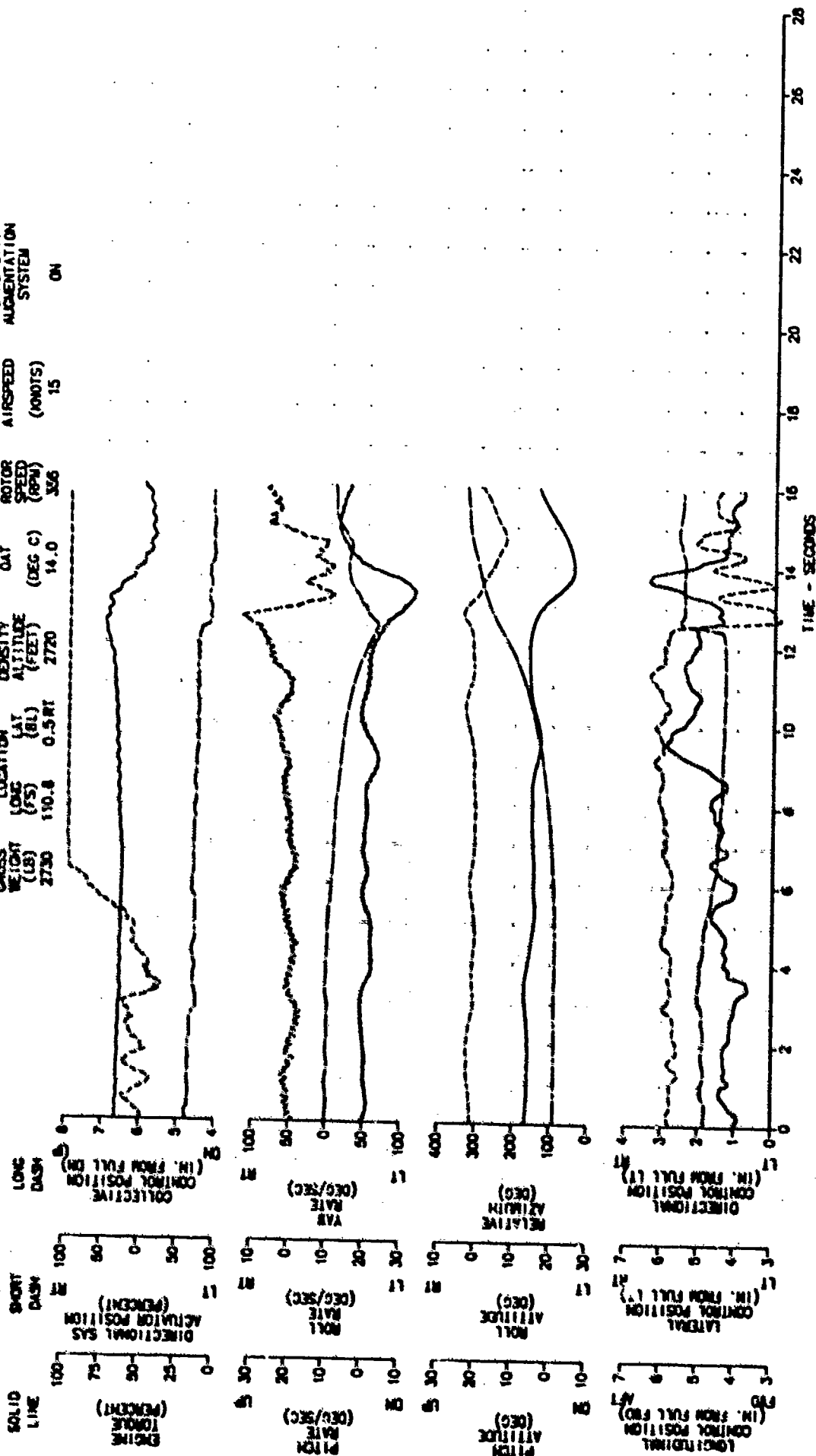


FIGURE E-198
LOW SPEED FLIGHT - LEFT YAW RATE

JOH-59C USA S/N 70-15349
TRUE
AIRSPEED
(KNOTS)
13
STABILITY
AUGMENTATION
SYSTEM
OFF

AVG GROSS
WEIGHT
(LB)
2770
AVG CG
LOCATION
LONG
(FS)
110.8
LAT
(BL)
0.5 RT
AVG
DENSITY
ALTITUDE
(FEET)
2540
OAT
(DEG C)
12.5
TRIM
ROTOR
SPEED
(RPM)
357

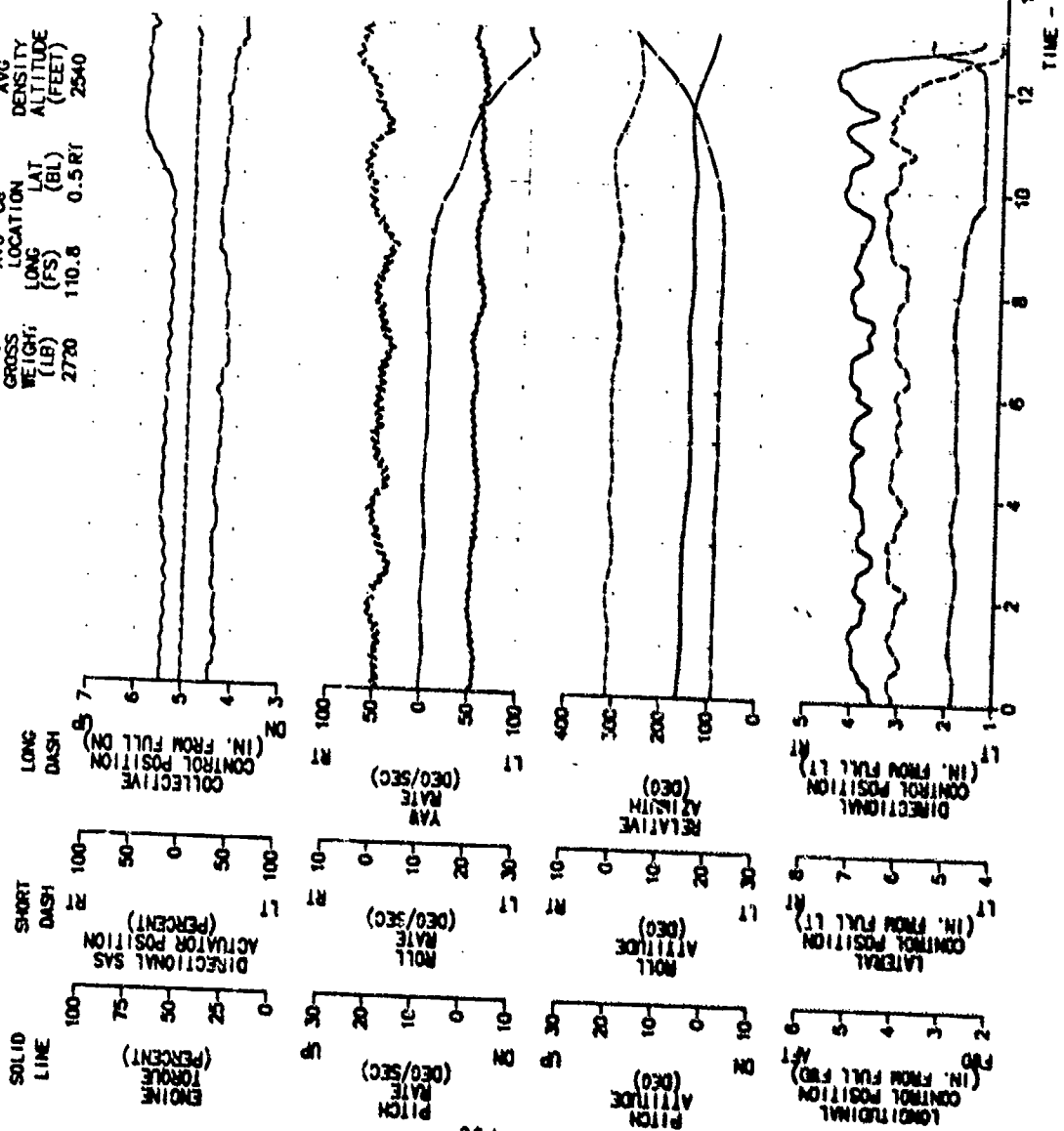


FIGURE E-199
LOW SPEED FLIGHT-RIGHT YAW RATE

JOH-58C USA S/N 70-15349
AVG CROSS WEIGHT (LB) 2860
AVG CG LONG (FS) 110.2
AVG CG LAT (BL) 0.3 RT
AVG DENSITY ALT (DEG C) 34.5
TRIM ROTOR SPEED (RPM) 354
TRUE AIRSPEED (KNOTS) 15
STABILITY AUGMENTATION SYSTEM ON

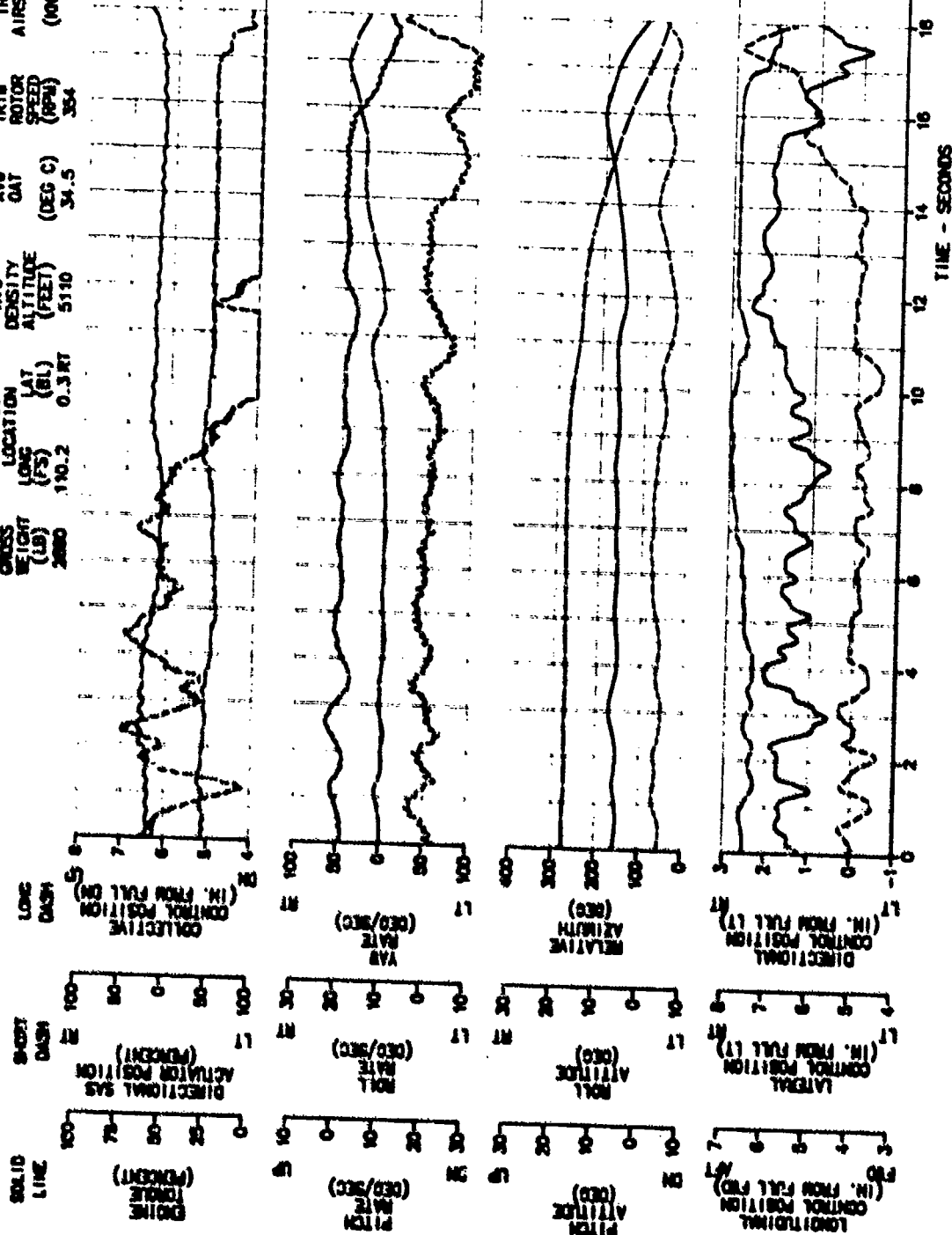
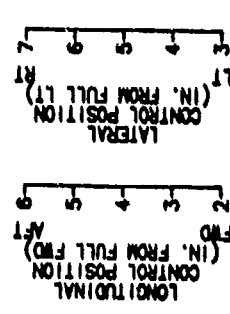
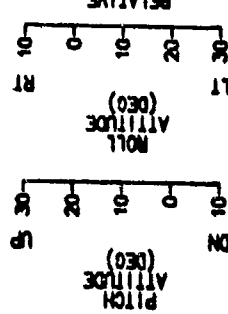
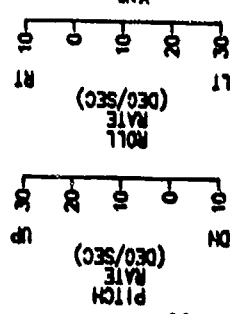
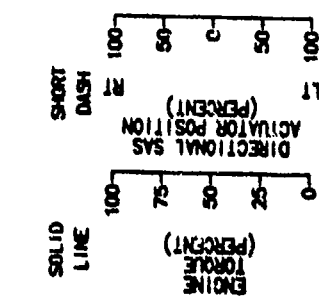


FIGURE E-201
LOW SPEED FLIGHT - LEFT YAW RATE

JOH-58C USA S/N 70-15349
TRIM ROTOR SPEED (RPM) 356
TRUE AIRSPEED (KNOTS) 20
STABILITY AUGMENTATION SYSTEM ON



TIME - SECONDS

FIGURE E-202
LOW SPEED FLIGHT - LEFT YAW RATE

JOH-58C USA S/N 70-15349
STABILITY AUGMENTATION SYSTEM OFF

TRUE AIRSPEED (KNOTS) 20
TRIM ROTOR SPEED (RPM) 356
AVG OAT (DEG C) 12.0
AVG DENSITY ALTITUDE (FEET) 2470
AVG CG LOCATION
LONG (FS) 110.3
LAT (BL) 0.3 RT
AVG GROSS WEIGHT (LB) 2730

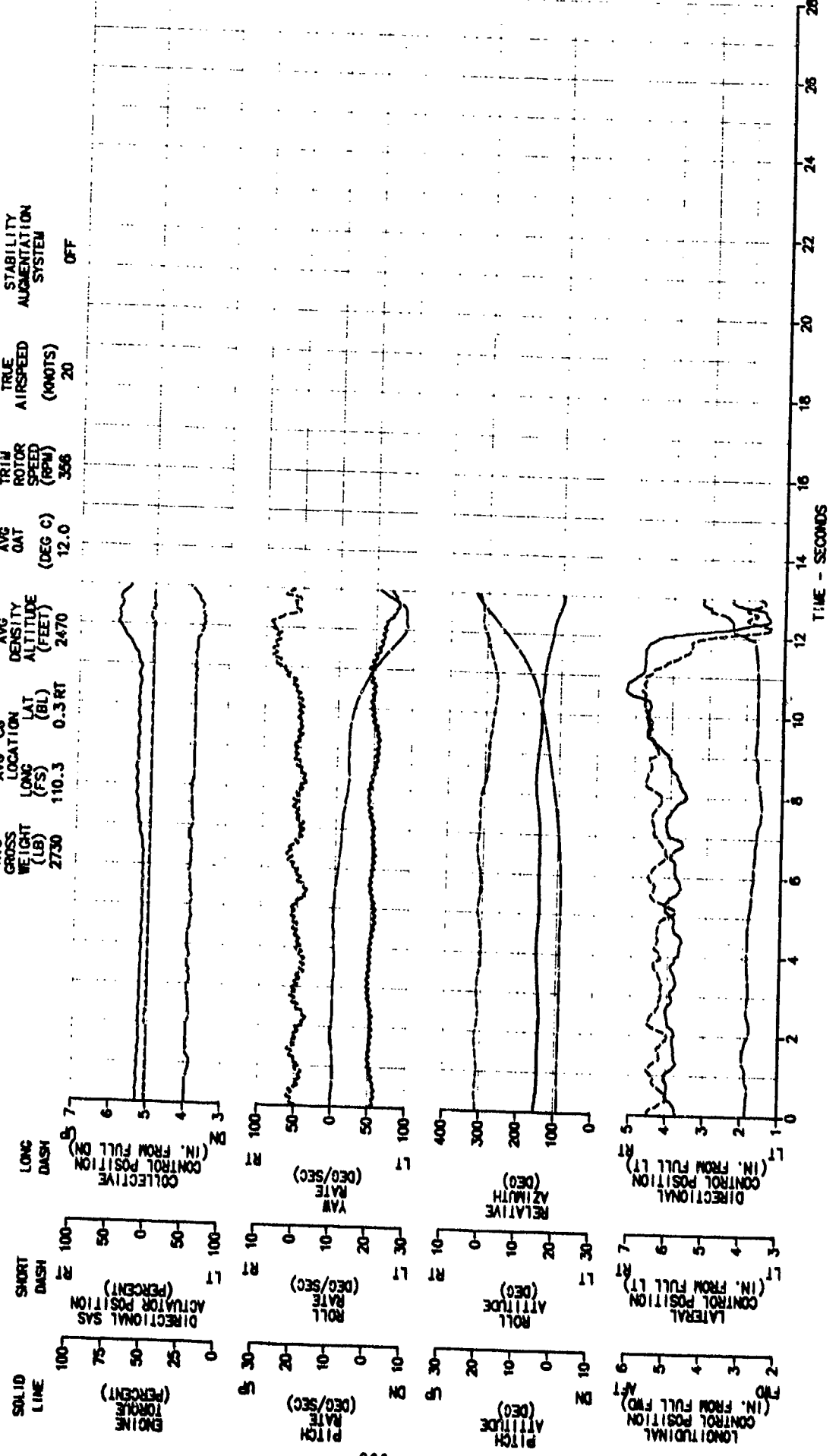


FIGURE E-203
LOW SPEED FLIGHT-RIGHT YAW RATE

JOH-50C USA S/N 70-15349
 TRUE AIRSPEED (KNOTS) 20
 TRIM ROTOR SPEED (RPM) 357
 AVG OAT (DEG C) 35.0
 AVG DENSITY ALTITUDE (FEET) 5140
 AVG CG LONG (FS) 110.2 LAT 0.3 RT
 STABILITY AUGMENTATION SYSTEM ON

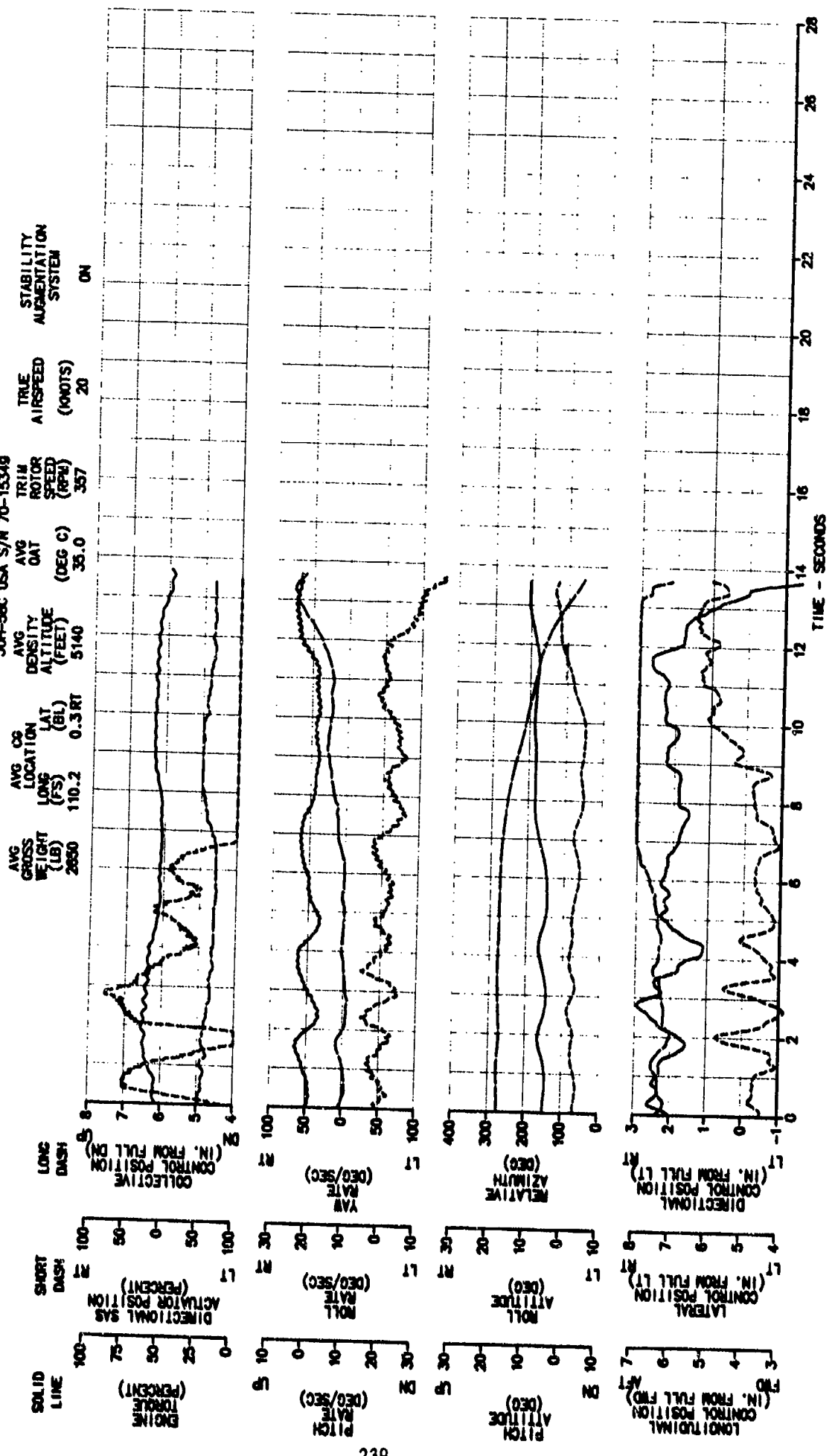


FIGURE E-204
LOW SPEED FLIGHT-RIGHT YAW RATE

J04-58C USA S/N 70-15349
 TRUE AIRSPEED (KNOTS) 22
 STABILITY AUGMENTATION SYSTEM OFF
 TRIM ROTOR SPEED (RPM) 357
 AVG OAT (DEG C) 35.5
 AVG DENSITY ALTITUDE (FEET) 5190
 AVG CG LONG (FS) 110.2 0.3 RT
 AVG GROSS WEIGHT (LB) 2650

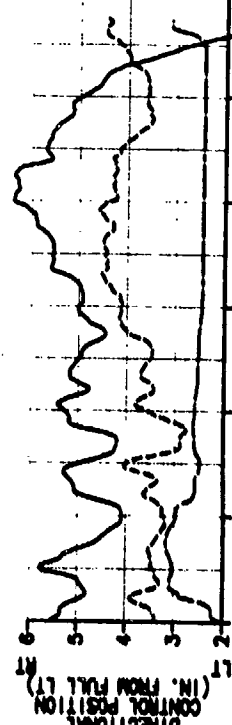
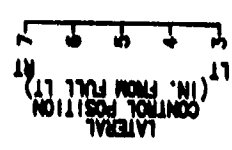
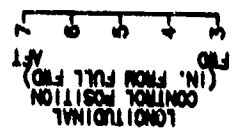
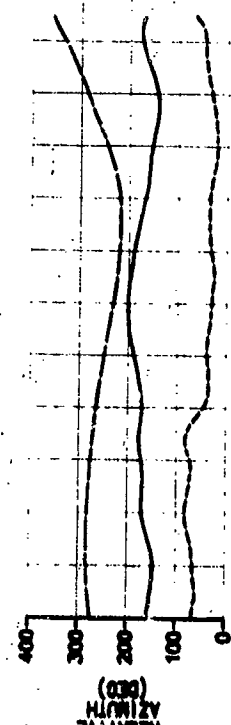
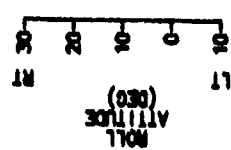
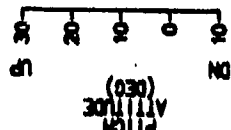
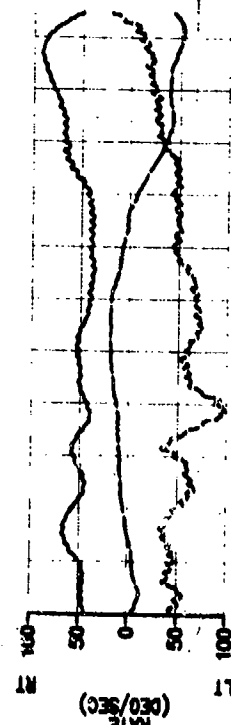
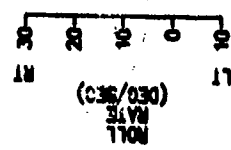
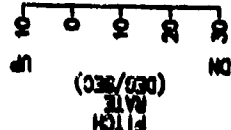
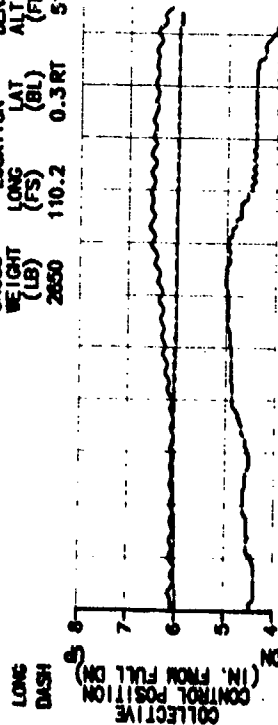
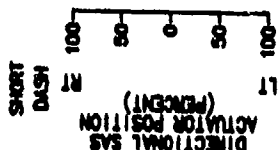
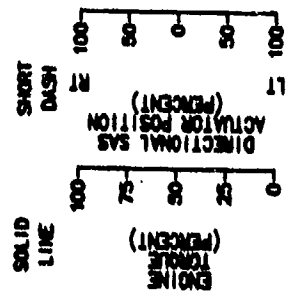


FIGURE E-205
LOW SPEED FLIGHT - LEFT YAW RATE

JOH-58C USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM
ON

AVG GROSS WEIGHT (LB) 2710
AVG CS LONG (FS) 110.3
AVG CS LAT (BL) 0.3 RT
AVG DENSITY ALTITUDE (FEET) 2450
AVG OAT (DEG C) 11.5
TRIM ROTOR SPEED (RPM) 357
TRUE AIRSPEED (KNOTS) 24

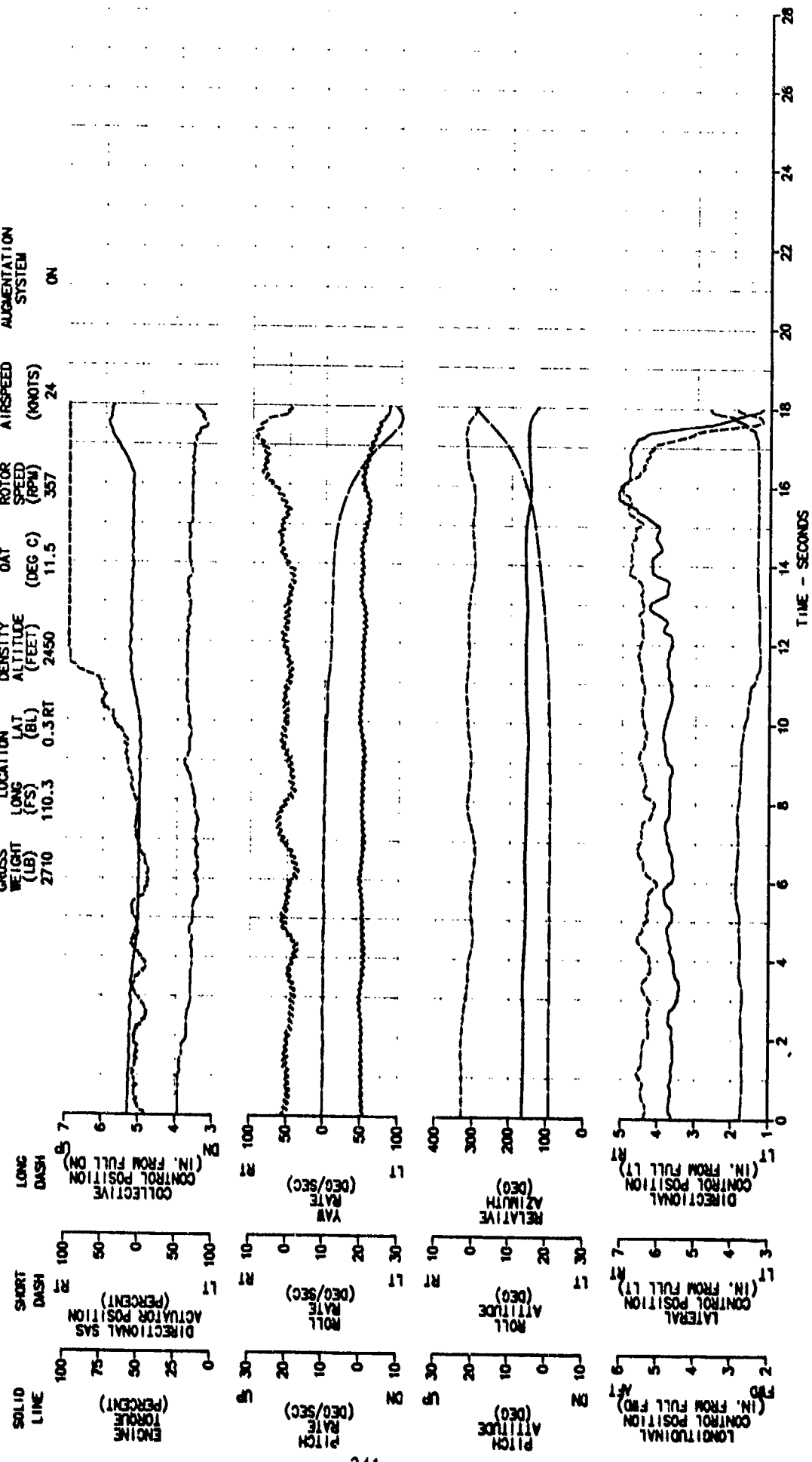


FIGURE E-208
LOW SPEED FLIGHT - LEFT YAW RATE

JOH-58C USA S/N 70-15349

AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG DENSITY ALTITUDE (FEET)	AVG OAT (DEG C)	TRIM ROTOR SPEED (RPM)	TRUE AIRSPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
2700	110.2 0.3 RT	2530	12.5	355	24	OFF

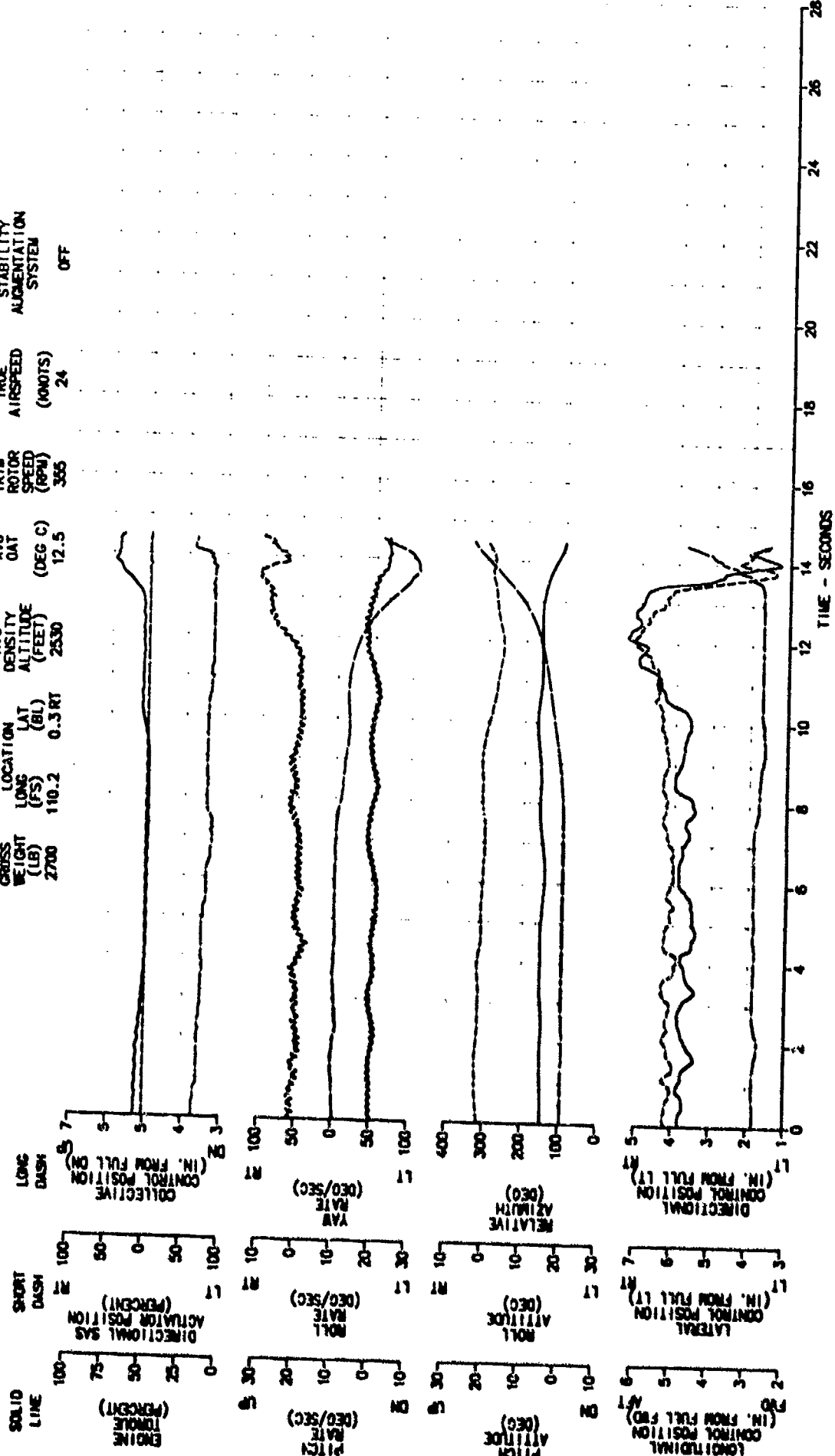


FIGURE E-207
LOW SPEED FLIGHT-RIGHT YAW RATE

JOH-58C USA S/N 70-15349

AVG GROSS WEIGHT (LB)	2630	AVG CG LOCATION (FS)	110.2	AVG LAT (BL)	0.3 RT	AVG DENSITY (DEG C)	35.0	AVG ROTOR SPEED (RPM)	350	TRUE AIRSPEED (KNOTS)	24	STABILITY AUGMENTATION SYSTEM	OFF
-----------------------	------	----------------------	-------	--------------	--------	---------------------	------	-----------------------	-----	-----------------------	----	-------------------------------	-----

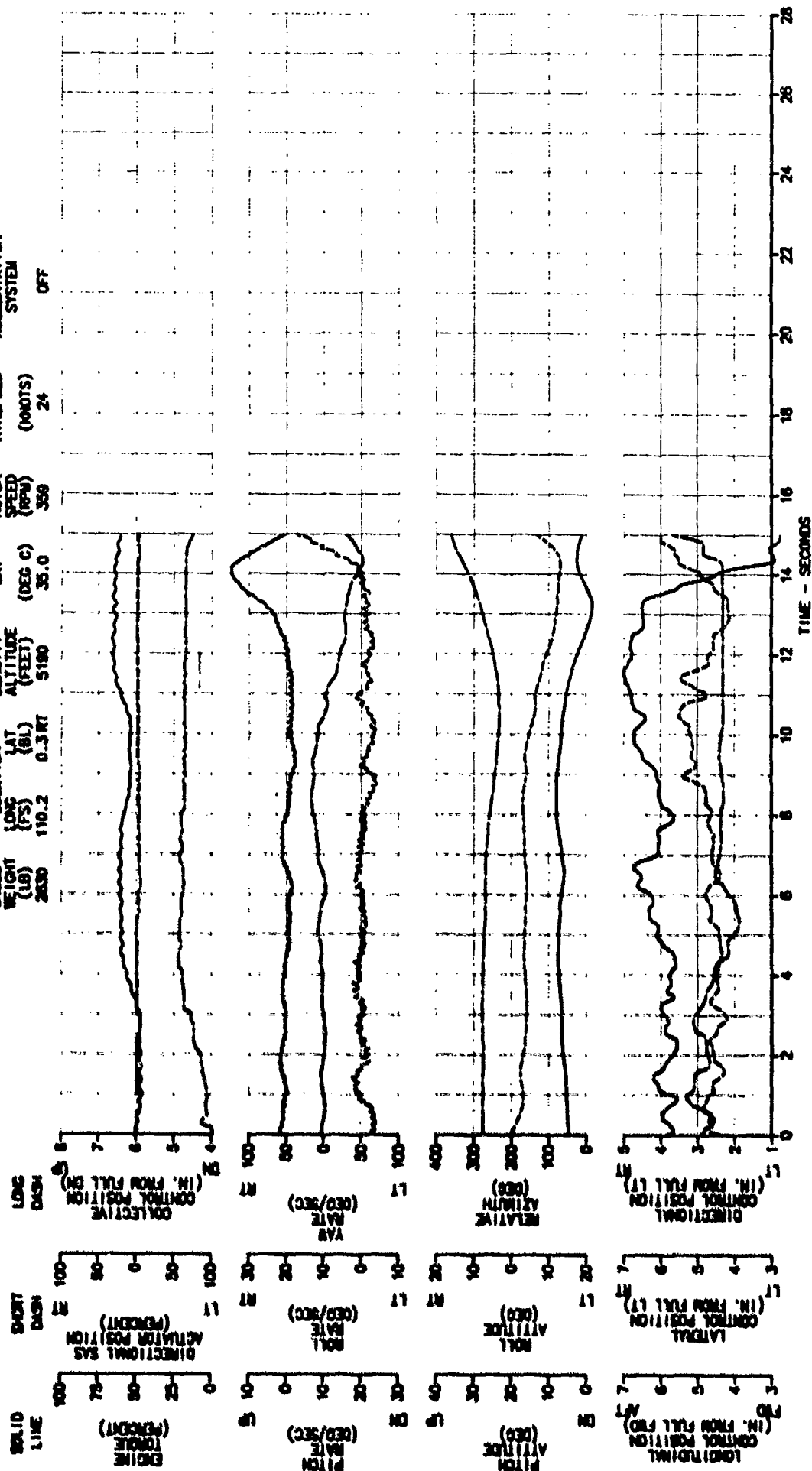


FIGURE E-208
LOW SPEED FLIGHT - LEFT YAW RATE

JOH-50C USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM
ON

TRUE
AIRSPEED
(KNOTS)
30

TRIM
ROTOR
SPEED
(RPM)
354

AVG
OAT
(DEG C)
13.5

AVG
DENSITY
ALTITUDE
(FEET)
2670

AVG CG
LOCATION
LAT (BL)
0.0 RT

AVG
GROSS
WEIGHT
(LB)
2720

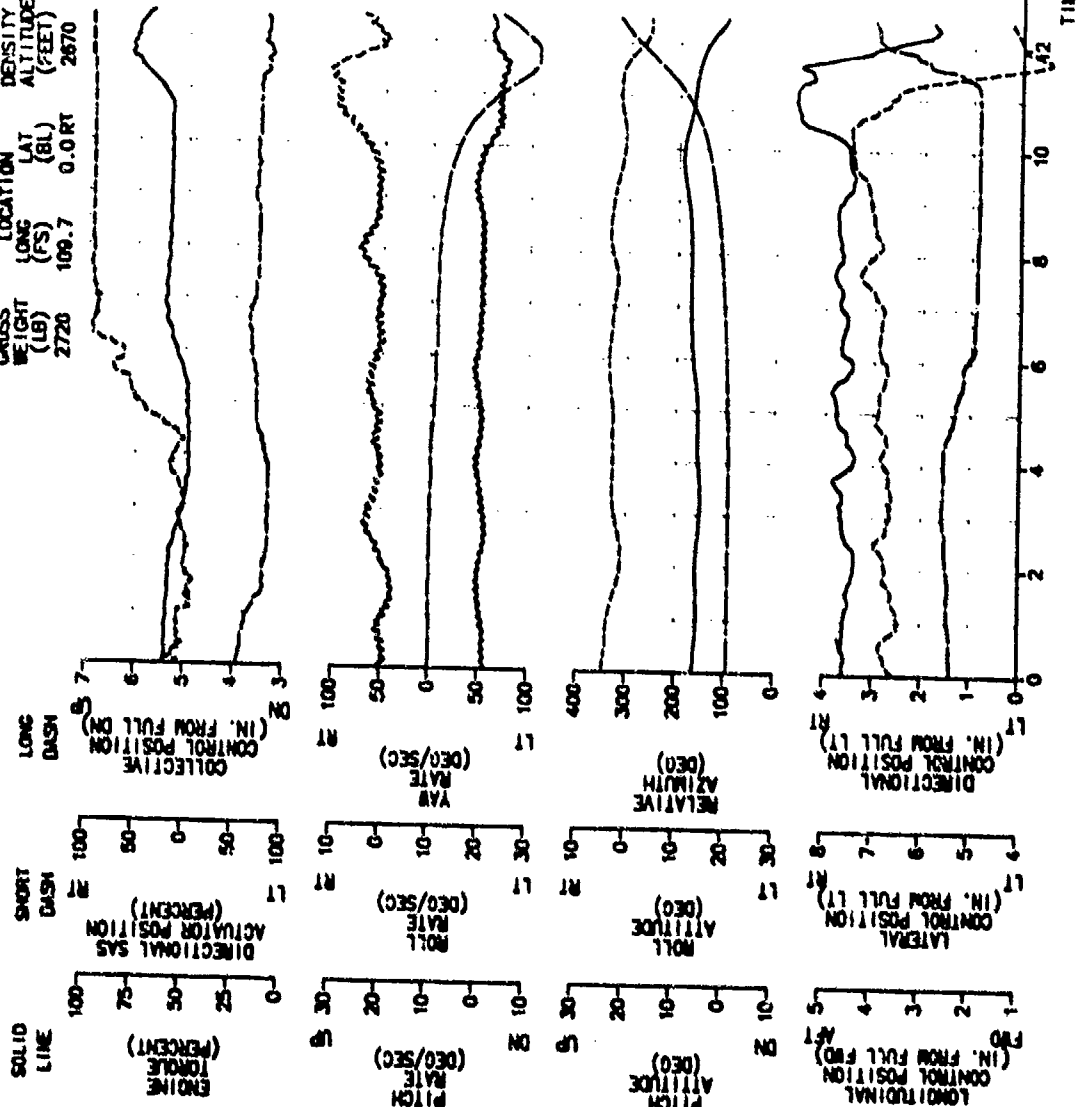


FIGURE E-209
DIRECTIONAL TRIM CHANGES WITH POWER
JOH-58C S/N 70-15349

SYM	AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG CG LOCATION LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	AVG CALIBRATED AIRSPEED (KT)	AVG SIDESLIP (DEG)
○	3030	108.0	0.2 LT	7370	19.5	357	30	30 LT
△	3050	108.1	0.2 LT	8090	18.5	357	31	21 LT
◇	3060	108.2	0.2 LT	8080	18.5	358	31	10 LT
⊠	3090	108.3	0.2 LT	7620	19.0	355	30	0
⊞	3090	108.8	0.2 LT	7670	21.5	358	33	9 RT
☆	3080	108.8	0.2 LT	7290	22.0	357	32	20 RT
⊕	3080	108.7	0.2 LT	7150	22.5	356	33	30 RT

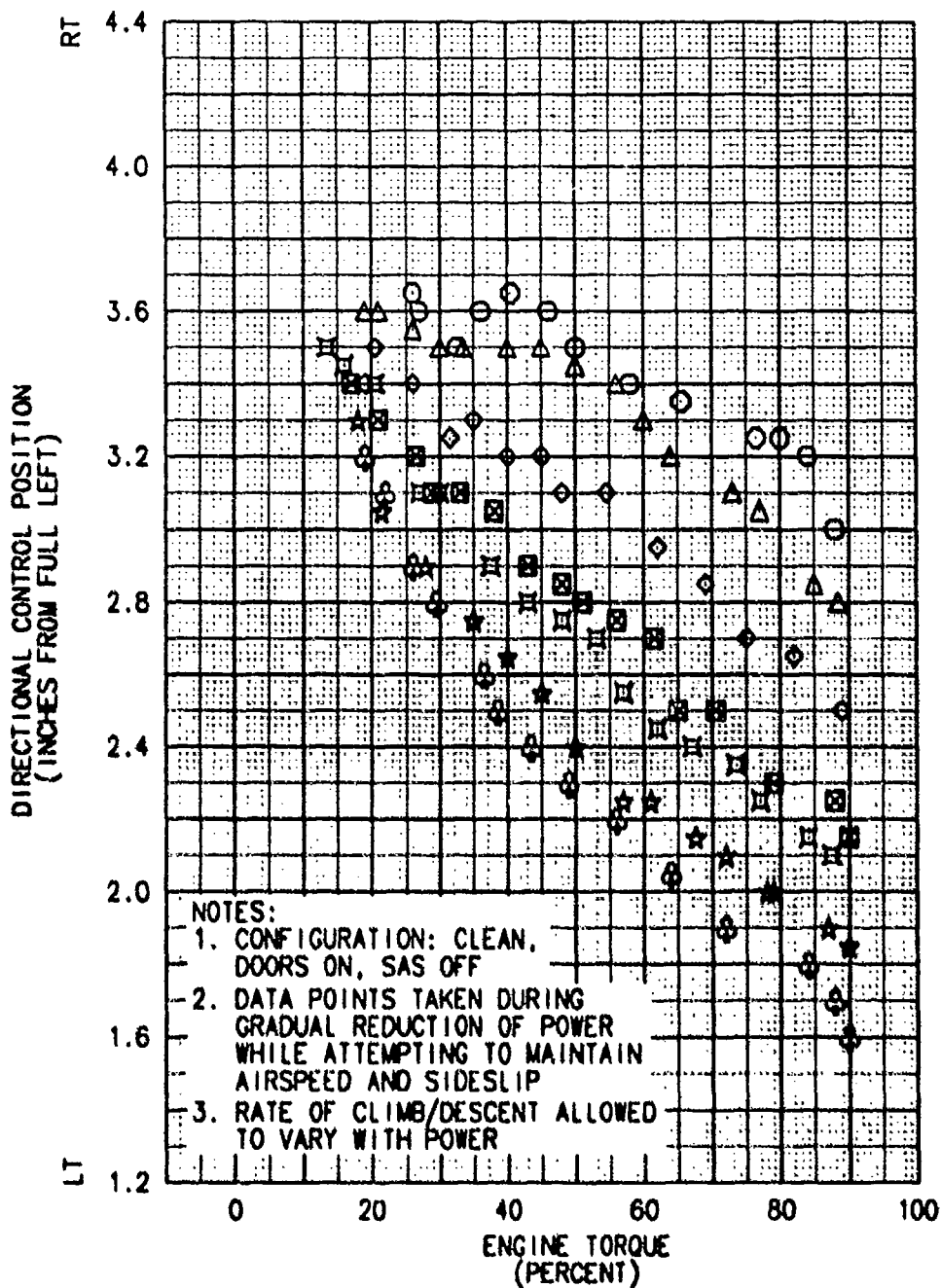


FIGURE E-210
DIRECTIONAL TRIM CHANGES WITH POWER
JOH-58C S/N 70-15349

SYM	AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG CG LOCATION LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	AVG CALIBRATED AIRSPEED (KT)	AVG SIDESLIP (DEG)
○	3040	107.9	0.2 LT	7870	18.5	358	39	31 LT
△	3040	107.9	0.2 LT	8460	18.0	358	40	21 LT
◇	3050	108.0	0.2 LT	8450	18.0	358	40	11 LT
⊠	3010	108.1	0.2 LT	8130	19.0	358	41	0
⊞	3070	108.1	0.2 LT	8280	18.5	358	40	10 RT
★	3070	108.1	0.2 LT	8070	19.0	357	39	21 RT
⊙	3060	108.0	0.2 LT	8420	18.5	357	40	30 RT

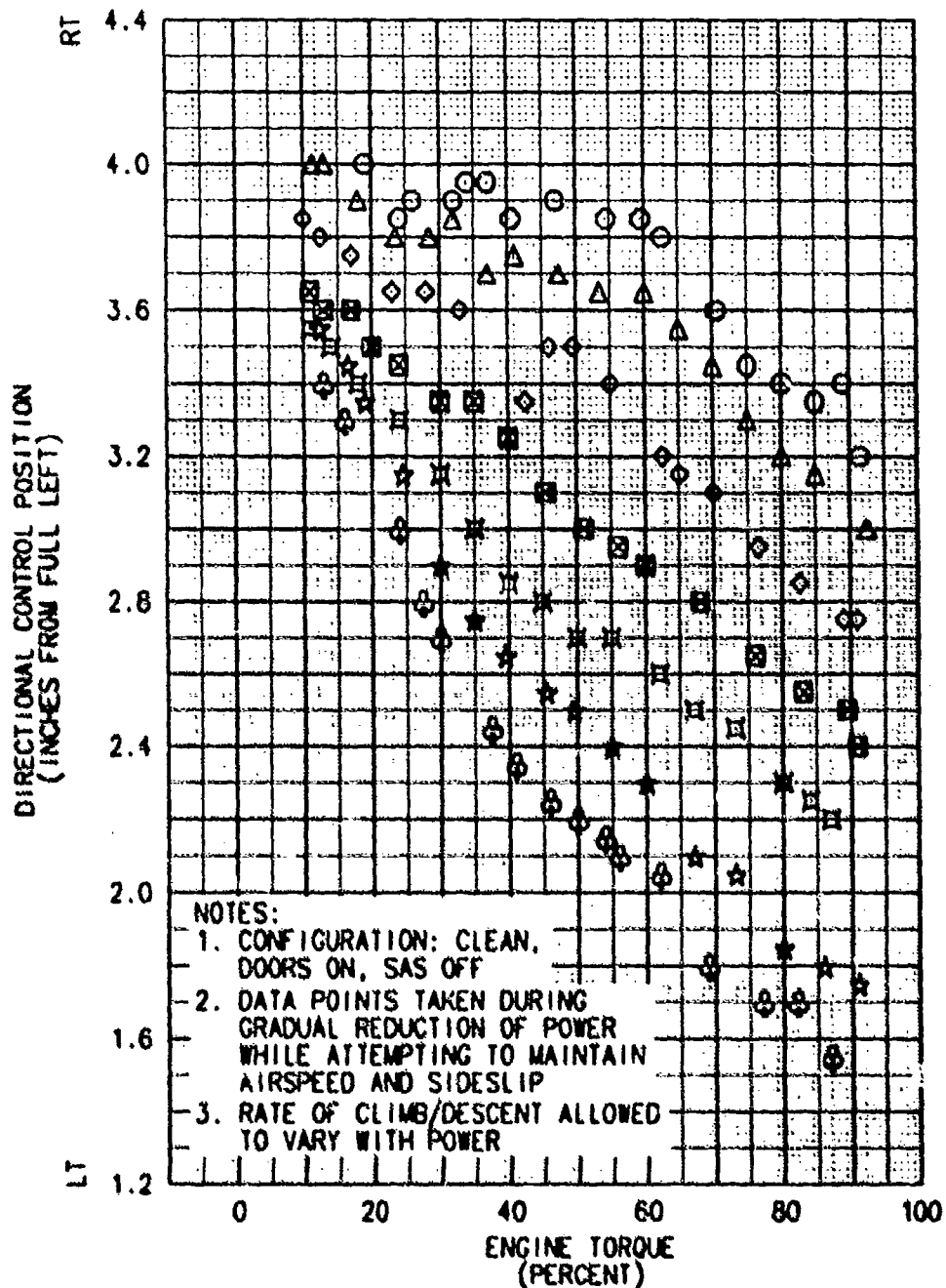


FIGURE E-211
DIRECTIONAL TRIM CHANGES WITH POWER
JOH-58C S/N 70-15349

SYM	AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG CG LOCATION LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	AVG CALIBRATED AIRSPEED (KT)	AVG SIDESLIP (DEG)
○	3090	108.1	0.2 LT	7690	19.0	358	51	32 LT
△	3100	108.2	0.2 LT	8250	18.0	358	52	21 LT
◇	3110	108.2	0.2 LT	7100	18.5	358	51	11 LT
⊠	3130	108.3	0.2 LT	7920	19.0	359	51	2 LT
⊞	3120	108.3	0.2 LT	8520	18.0	358	52	10 RT
☆	3120	108.3	0.2 LT	7930	18.5	358	52	21 RT
⊗	3110	108.2	0.2 LT	7710	19.0	357	51	30 RT

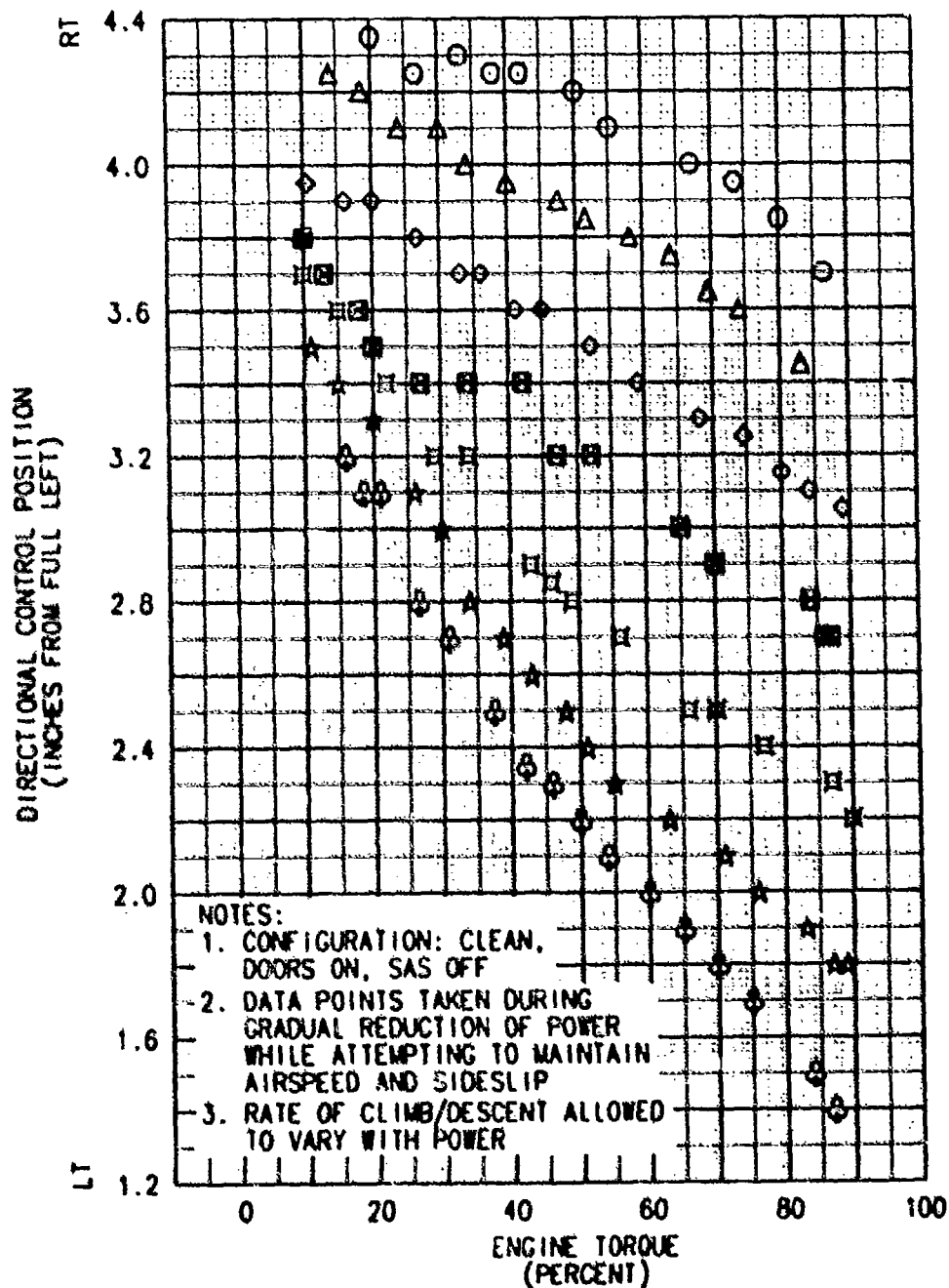
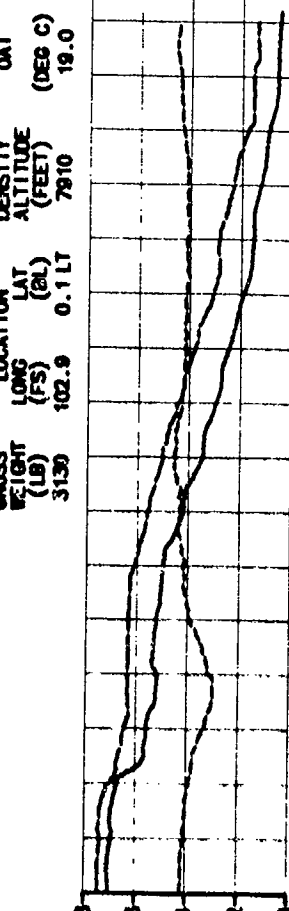
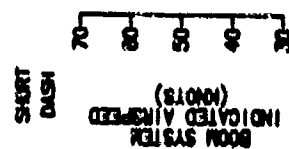
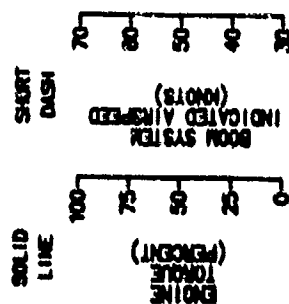


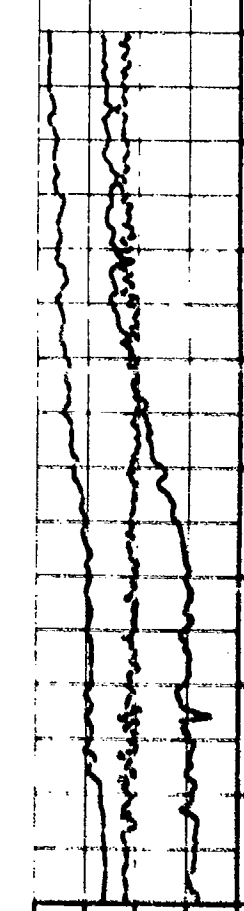
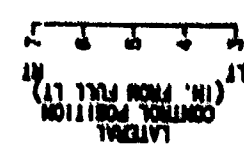
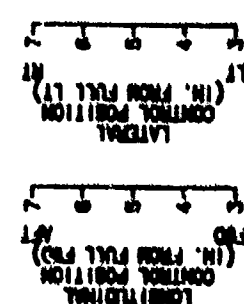
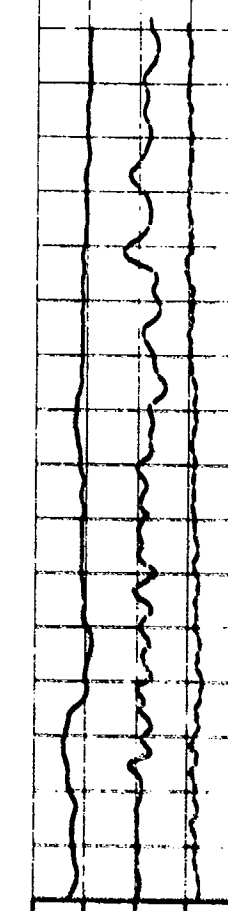
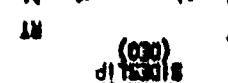
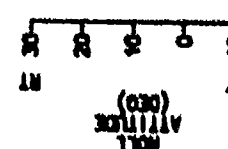
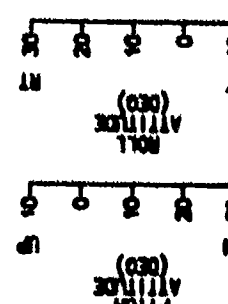
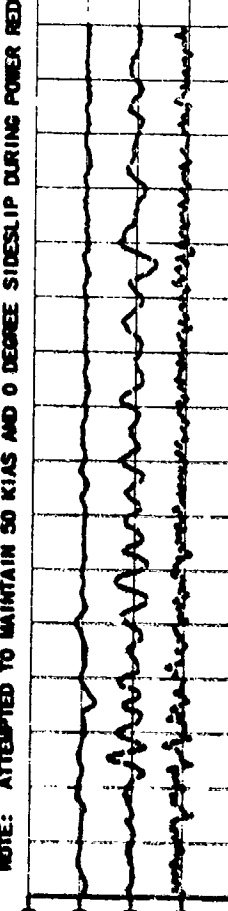
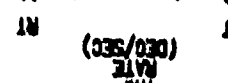
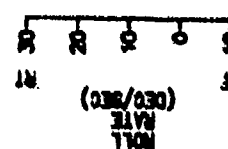
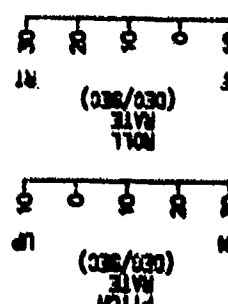
FIGURE E-212
DIRECTIONAL TRIM CHANGE WITH POWER

JOH-50C USA S/N 70-15349

AVG CROSS WEIGHT (LB)	3130	AVG CG LONG (FS)	102.9	AVG CG LAT (BL)	0.1 LT	AVG DENSITY ALTITUDE (FEET)	7910	AVG OAT (DEG C)	19.0	TRIM ROTOR SPEED (RPM)	354	STABILITY AUGMENTATION SYSTEM	OFF
-----------------------	------	------------------	-------	-----------------	--------	-----------------------------	------	-----------------	------	------------------------	-----	-------------------------------	-----



NOTE: ATTEMPTED TO MAINTAIN 50 KIAS AND 0 DEGREE SIDESLIP DURING POWER REDUCTION



TIME - SECONDS

FIGURE E-213
DIRECTIONAL TRIM CHANGE WITH POWER

JM-58C USA S/N 70-15346
AVG CROSS WEIGHT (LB) 3080
AVG CG LOCATION LONG (FS) 102.3
LAT (BL) 0.1 LT
AVG DENSITY ALTITUDE (FEET) 8120
AVG OAT (DEG C) 18.0
TRIM MOTOR SPEED (RPM) 363
STABILITY AUGMENTATION SYSTEM OFF

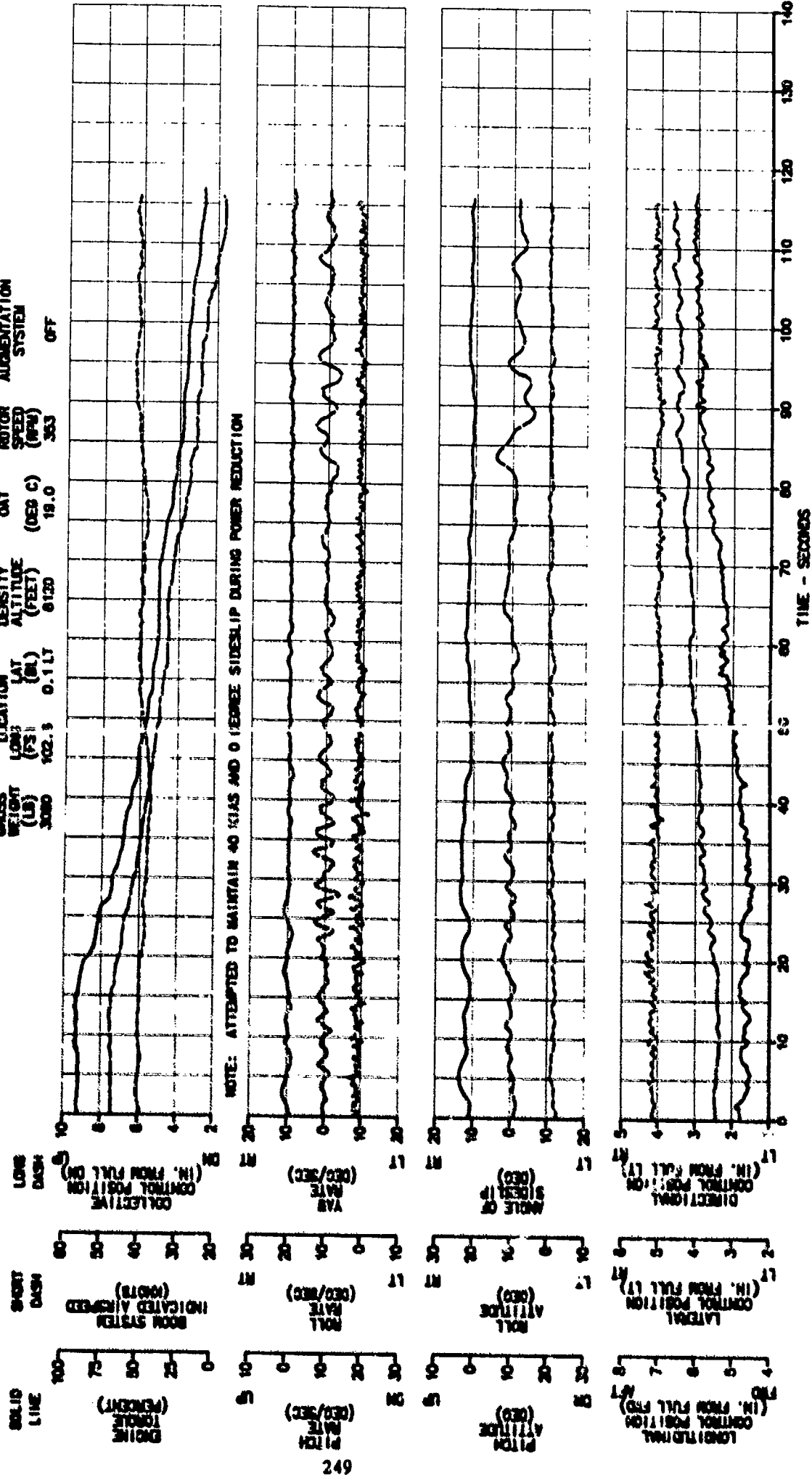


FIGURE E-214
DIRECTIONAL TRIM CHANGE WITH POWER

JOM-58C USA S/N 70-15349
AVG CG LONG (FS) 108.3 0.1 LT
AVG DENSITY ALT (DEG C) 22.5
AVG ALTITUDE (FEET) 5030
AVG CRUISE WEIGHT (LB) 2070
TRIM ROTOR SPEED (RPM) 354
STABILITY AUGMENTATION SYSTEM OFF

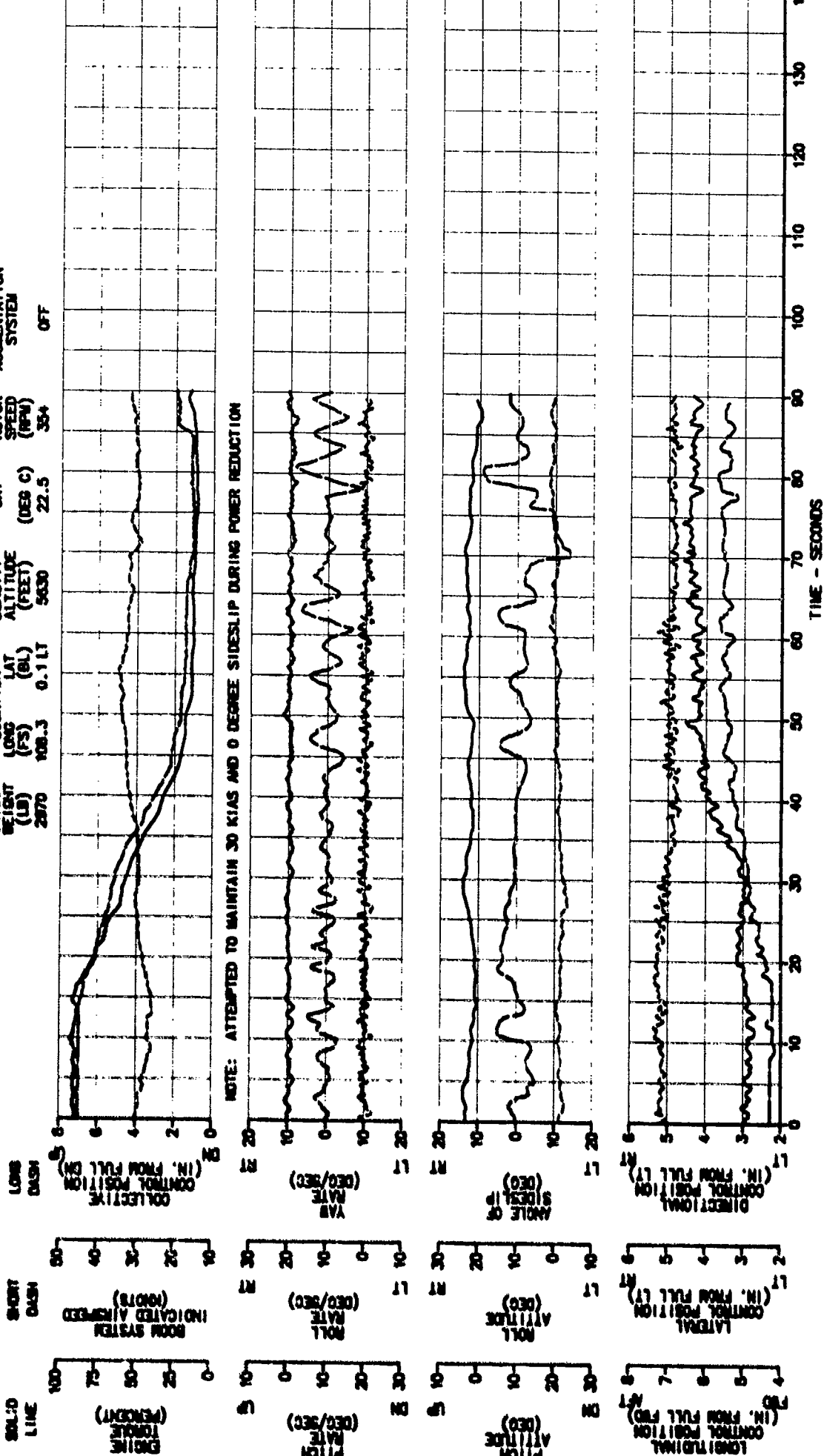


FIGURE E-215
DIRECTIONAL TRIM CHANGE WITH POWER
JOH-58C USA S/N 70-15349

AVG CROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	LAT (BL)	AVG DENSITY ALTITUDE (FEET)	AVG OAT (DEG C)	TRIM ROTOR SPEED (RPM)	STABILITY AUGMENTATION SYSTEM
3040	108.6	0-2 L7	6670	23.0	352	OFF

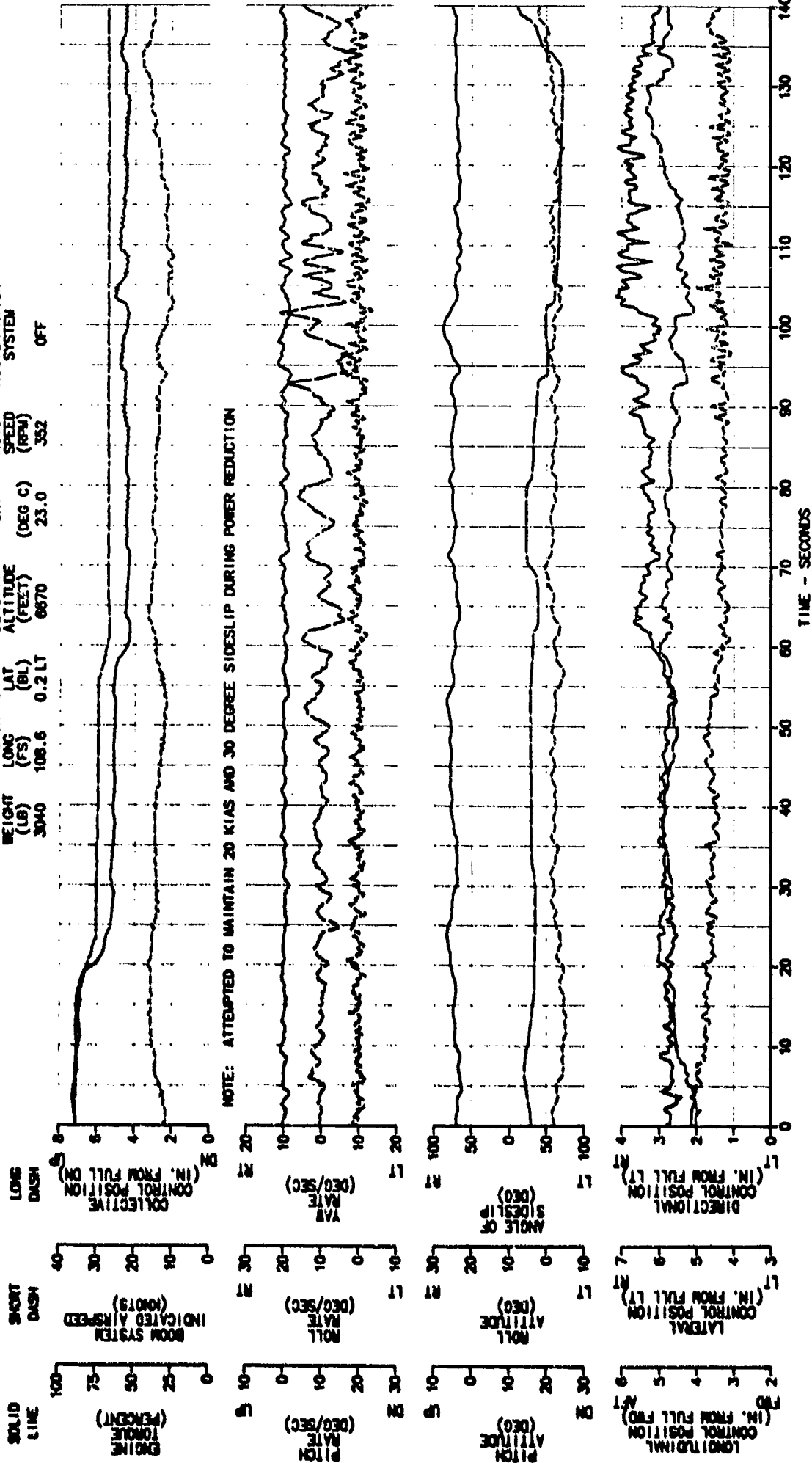


FIGURE E-216
DIRECTIONAL TRIM CHANGE WITH POWER
JOM-50C USA S/N 70-15348-

AVG GROSS WEIGHT (LB)	3020	AVG CG LONG (FS)	108.5	AVG LOCATION LAT (BL)	0.2 LT	AVG DENSITY ALT (DEG C)	23.0	TRIM ROTOR SPEED (RPM)	354	STABILITY AUGMENTATION SYSTEM	OFF
-----------------------	------	------------------	-------	-----------------------	--------	-------------------------	------	------------------------	-----	-------------------------------	-----

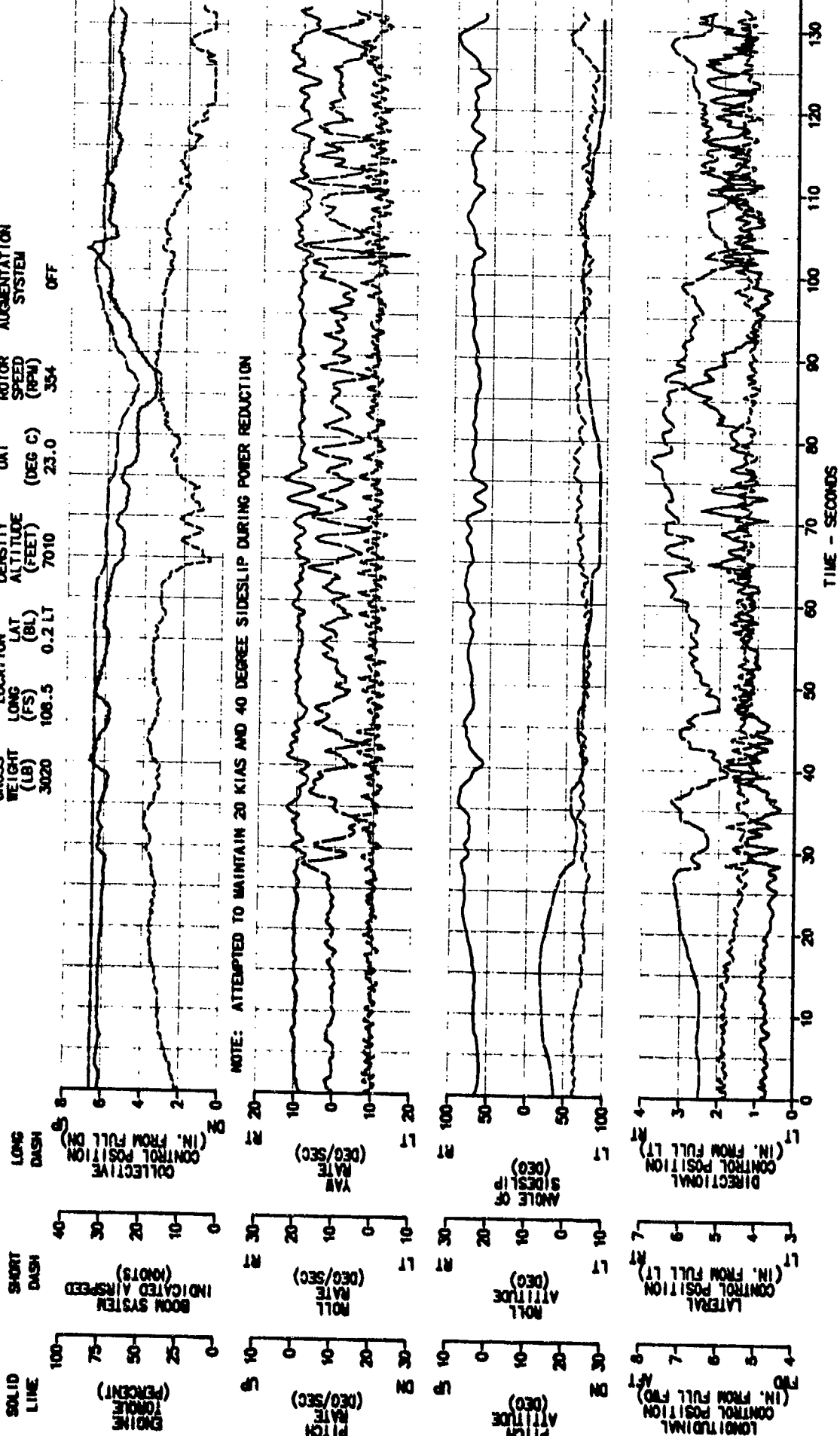
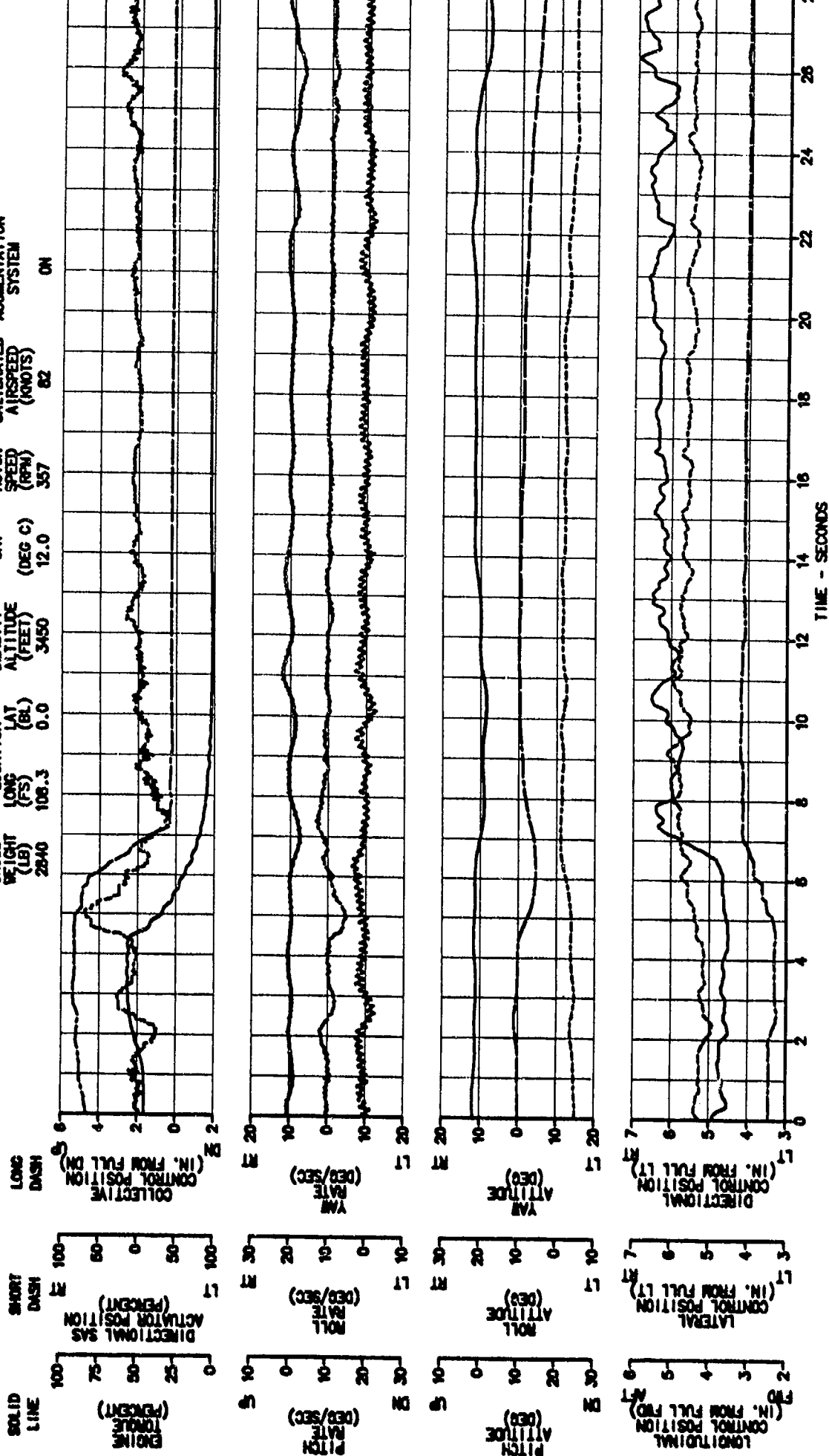


FIGURE E-217
SIMULATED ENGINE FAILURE

JOH-58C USA S/N 70-15349
AVG DENSITY ALTITUDE (FEET) 3450
AVG CG LOCATION LONG (FS) 106.3 LAT (BL) 0.0
AVG GROSS WEIGHT (LB) 2840
TRIM CALIBRATED AIRSPEED (KNOTS) 82
TRIM ROTOR SPEED (RPM) 357
STABILITY AUGMENTATION SYSTEM ON



AVG GROSS WEIGHT (LB)	2660	AVG CROSS LOCATION LAT (FS)	108.4	AVG CROSS LOCATION LONG (BL)	0.0	AVG DENSITY ALTITUDE (FEET)	2900	AVG OAT (DEG C)	14.5	TRIM ROTOR SPEED (RPM)	353	WIND SPEED (KNOTS)	23 - 36	STABILITY AUGMENTATION SYSTEM	ON
--------------------------------	------	---	-------	--	-----	--------------------------------------	------	-----------------------	------	---------------------------------	-----	--------------------------	---------	-------------------------------------	----

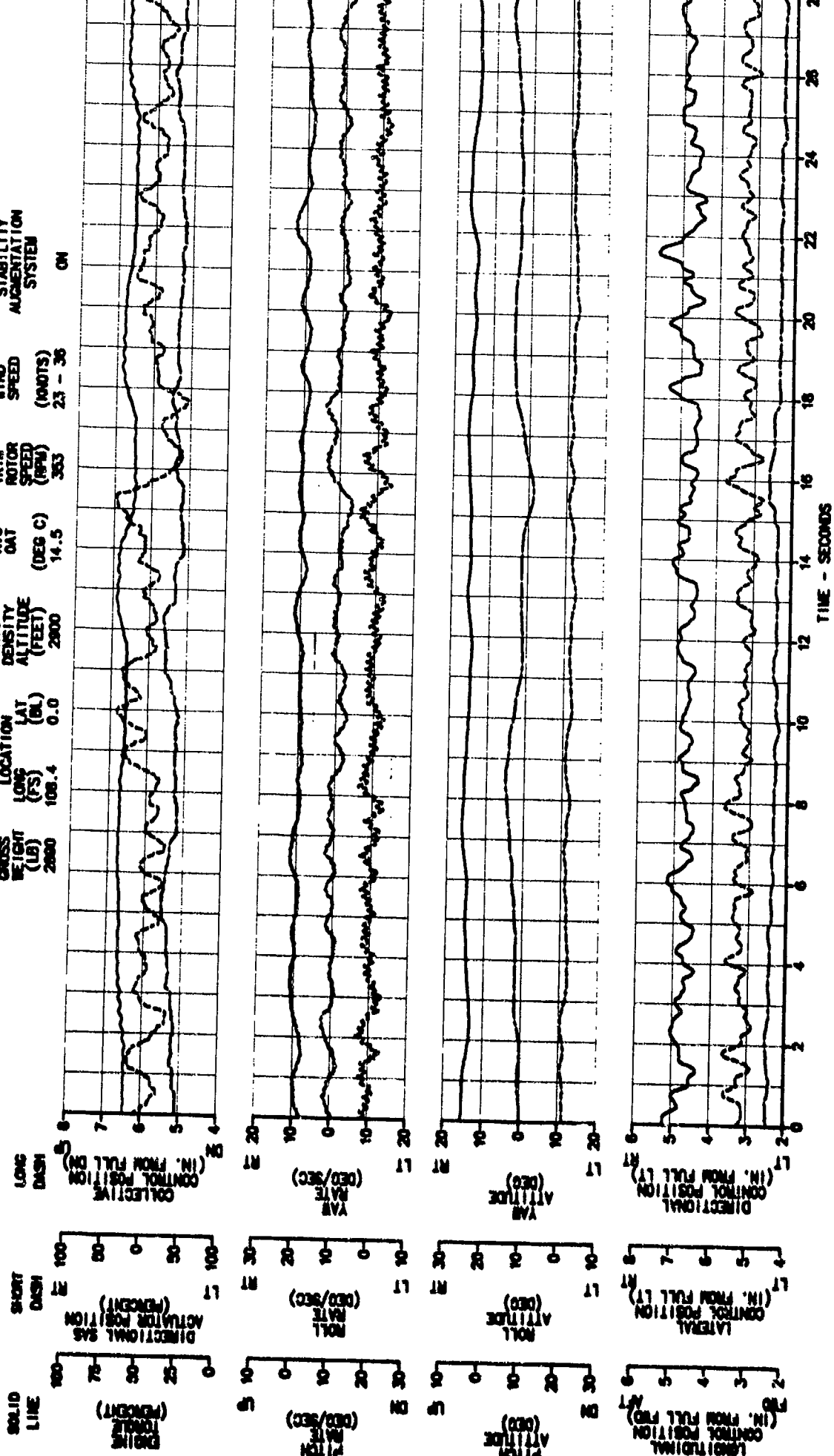


FIGURE E-219
ICE HOVER IN WINDS - 090 DEGREE AZIMUTH

JOH-56C USA S/N 70-15349
WIND SPEED (KNOTS) 10 - 15
STABILITY AUGMENTATION SYSTEM ON
TRIM MOTOR SPEED (RPM) 353
AVG DENSITY ALTITUDE (FEET) 2800
AVG OAT (DEG C) 15.5
AVG CS LOCATION LAT (ML) 0.1 LT
AVG LONG (FS) 108.4
AVG GROSS WEIGHT (LB) 2800

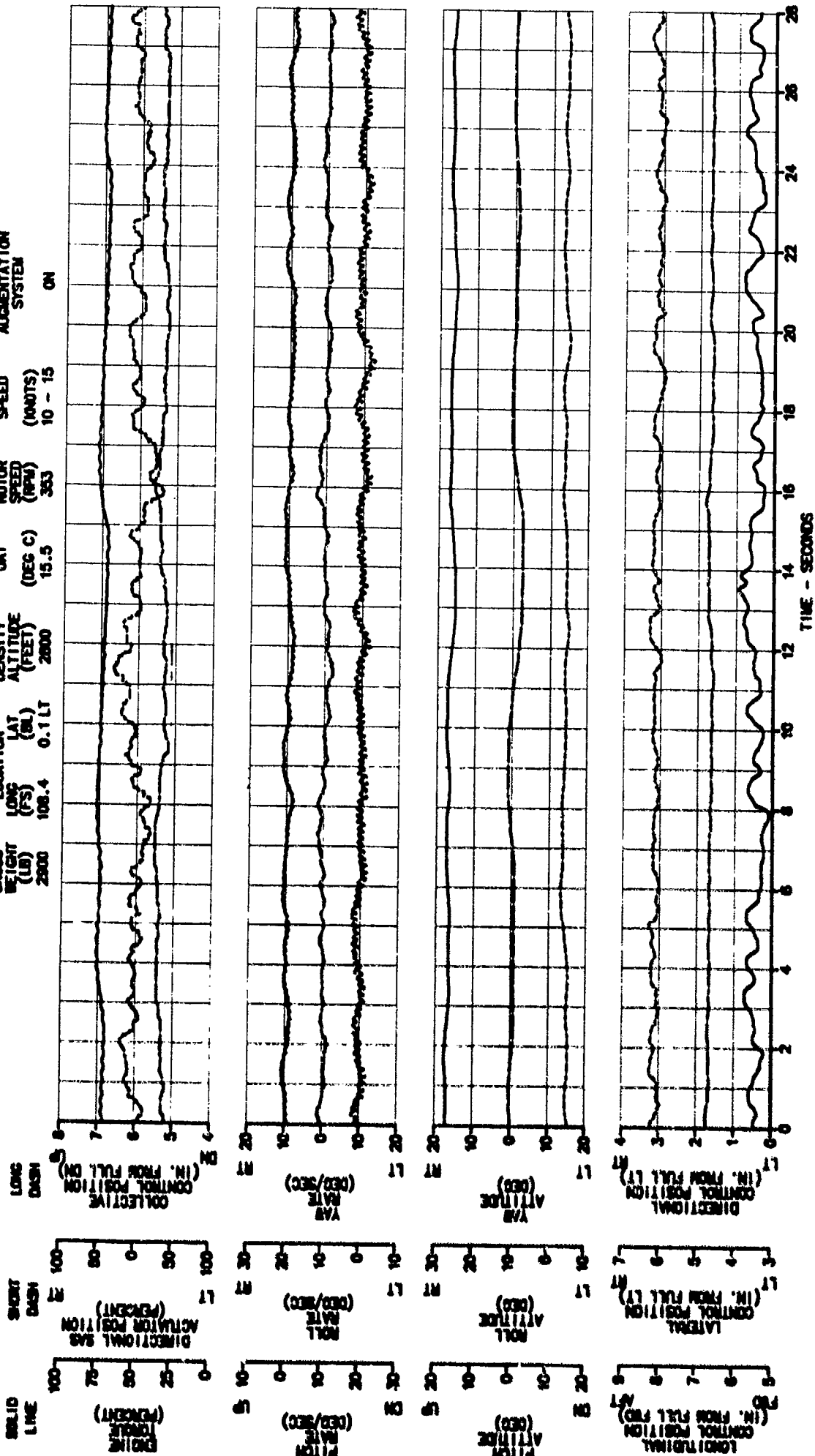
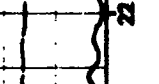
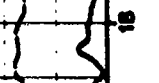
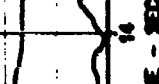
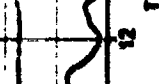
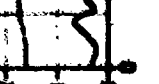
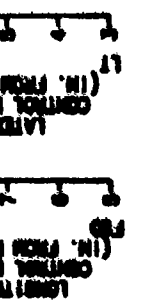
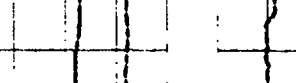
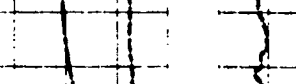
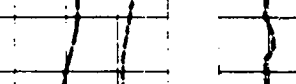
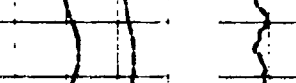
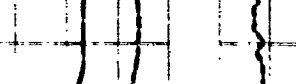
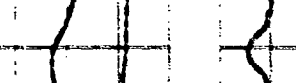
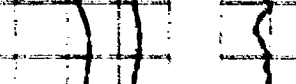
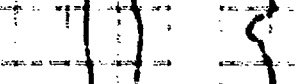
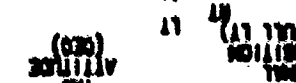
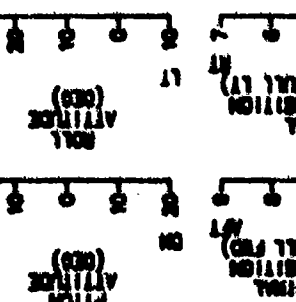
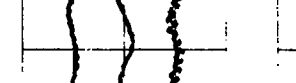
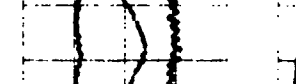
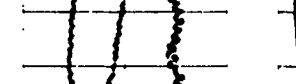
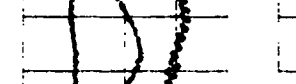
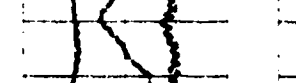
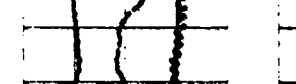
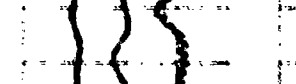
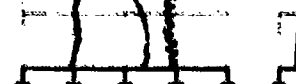
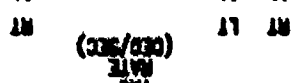
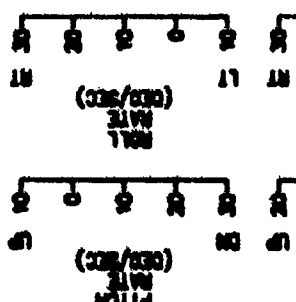
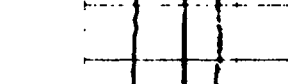
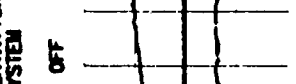
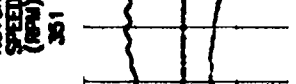
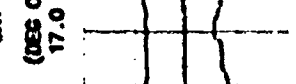
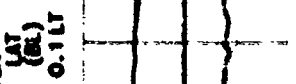
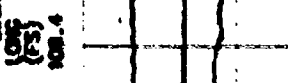
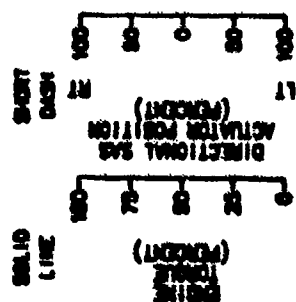


FIGURE E-220
ICE HOVER IN WINDS - 090 DEGREE AZIMUTH

J01-08C USA S/N 70-15349
WIND SPEED (KNOTS) 10 - 15
STABILITY AUGMENTATION SYSTEM OFF
AVG CROSS WEIGHT (LB) 2000
AVG CG LOCATION LONG (FS) 108.4 LAT (BL) 0.1 LT
AVG DENSITY OAT (DEG C) 17.0
TRIM ROTOR SPEED (RPM) 351



TIME - SECONDS

FIGURE E-221

ICE HOVER IN WINDS - 090 DEGREE AZIMUTH

JOH-SBC USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM

ON

WIND
SPEED
(KNOTS)
23 - 36

TRIM
MOTOR
SPEED
(RPM)
351

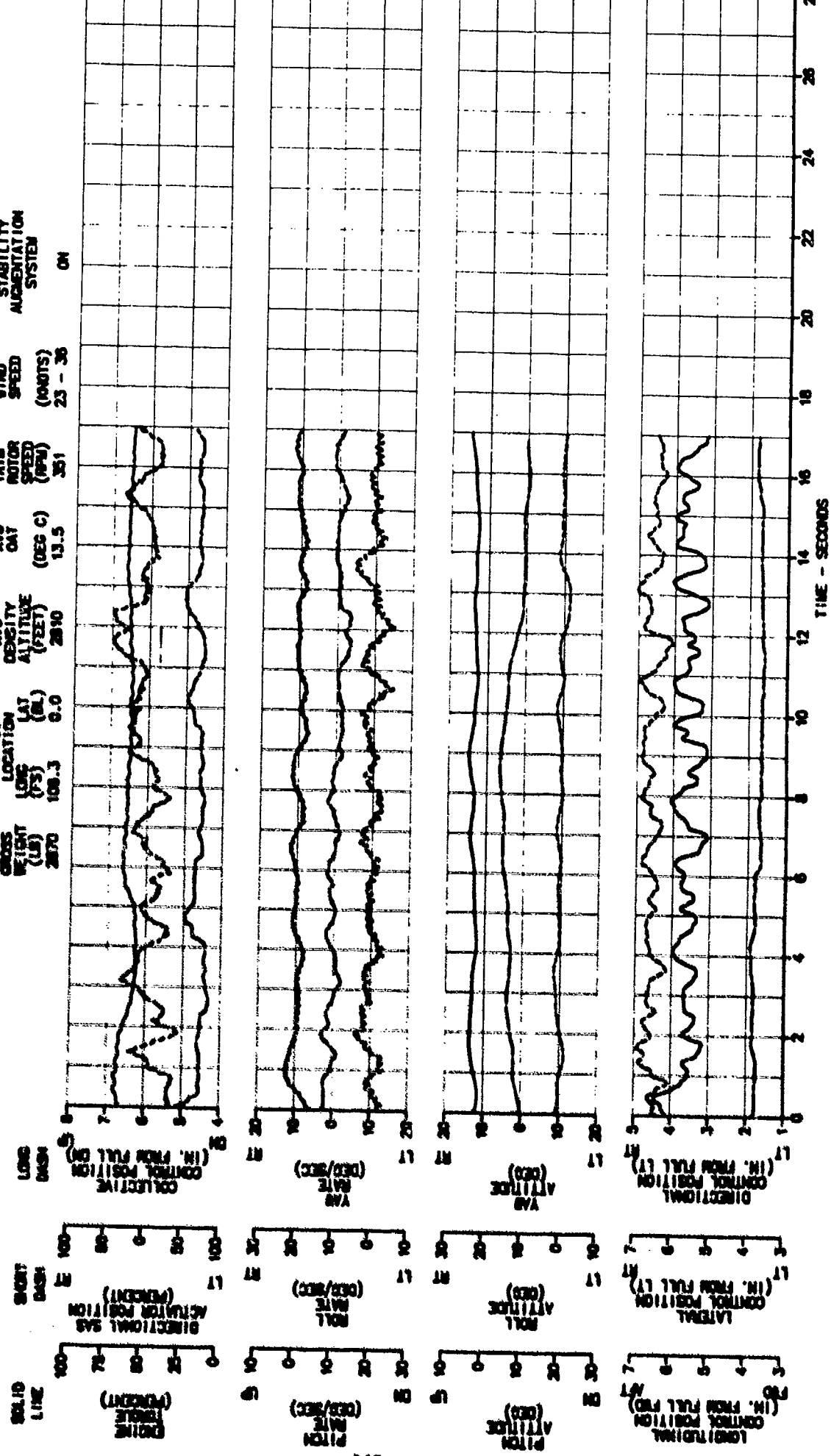
AVG
OAT
(DEG C)
13.5

AVG
ALTITUDE
(FEET)
2810

AVG CG
LOCATION
LAT (DL)
0.0

AVG CG
LOCATION
LONG (PS)
100.3

AVG
GROSS
WEIGHT
(LB)
2870



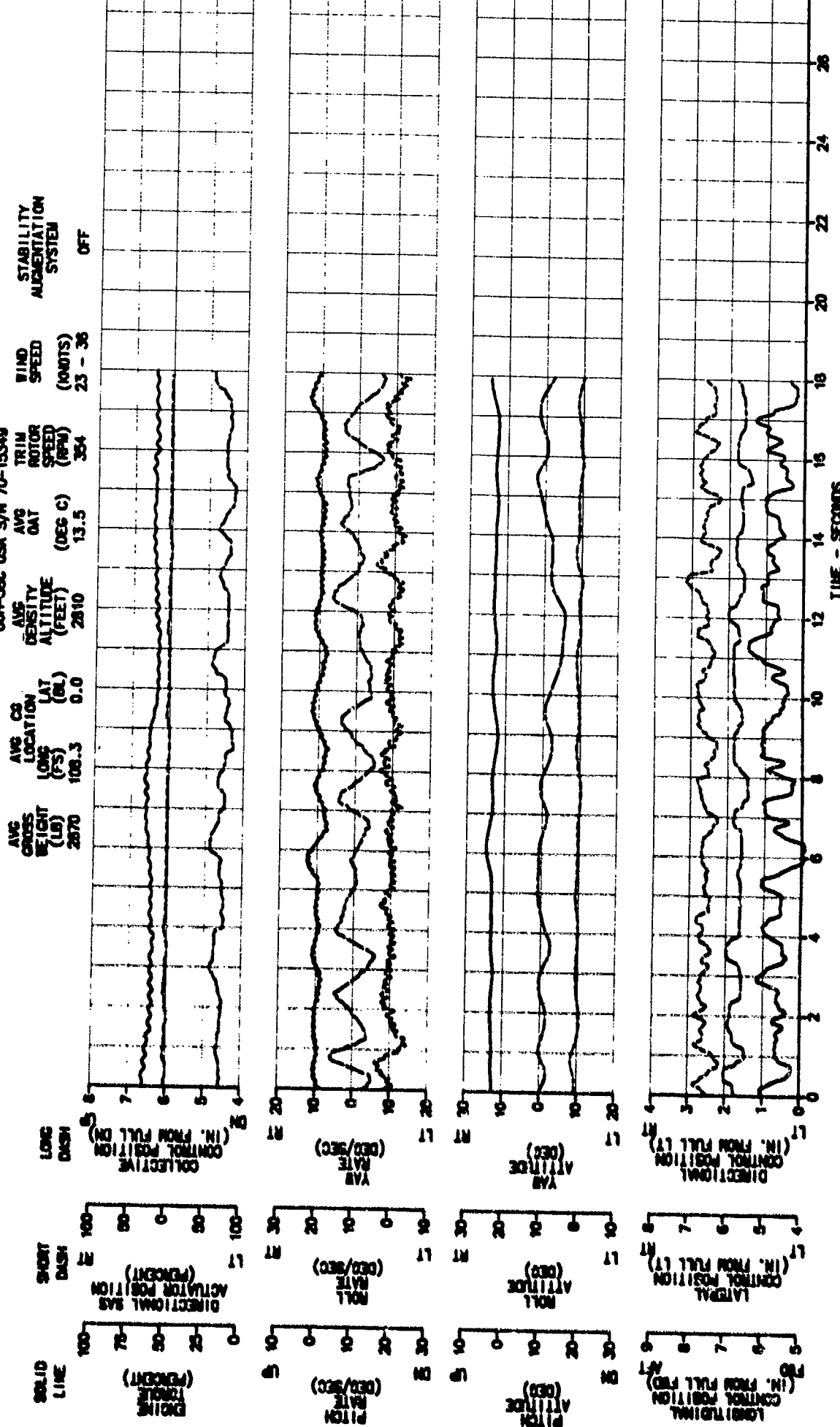


FIGURE E-223
ICE HOVER IN WINDS - 120 DEGREE AZIMUTH

J04-50C USA S/N 70-15349
WIND SPEED (KNOTS) 10 - 15
STABILITY AUGMENTATION SYSTEM ON
TRIM Rotor SPEED (RPM) 303
AVG OAT (DEG C) 19.5
DENSITY ALTITUDE (FEET) 3300
AVG CG LOCATION LAT (DL) 0.1 LT
AVG LONG (FS) 108.4
AVG GROSS WEIGHT (LB) 2800

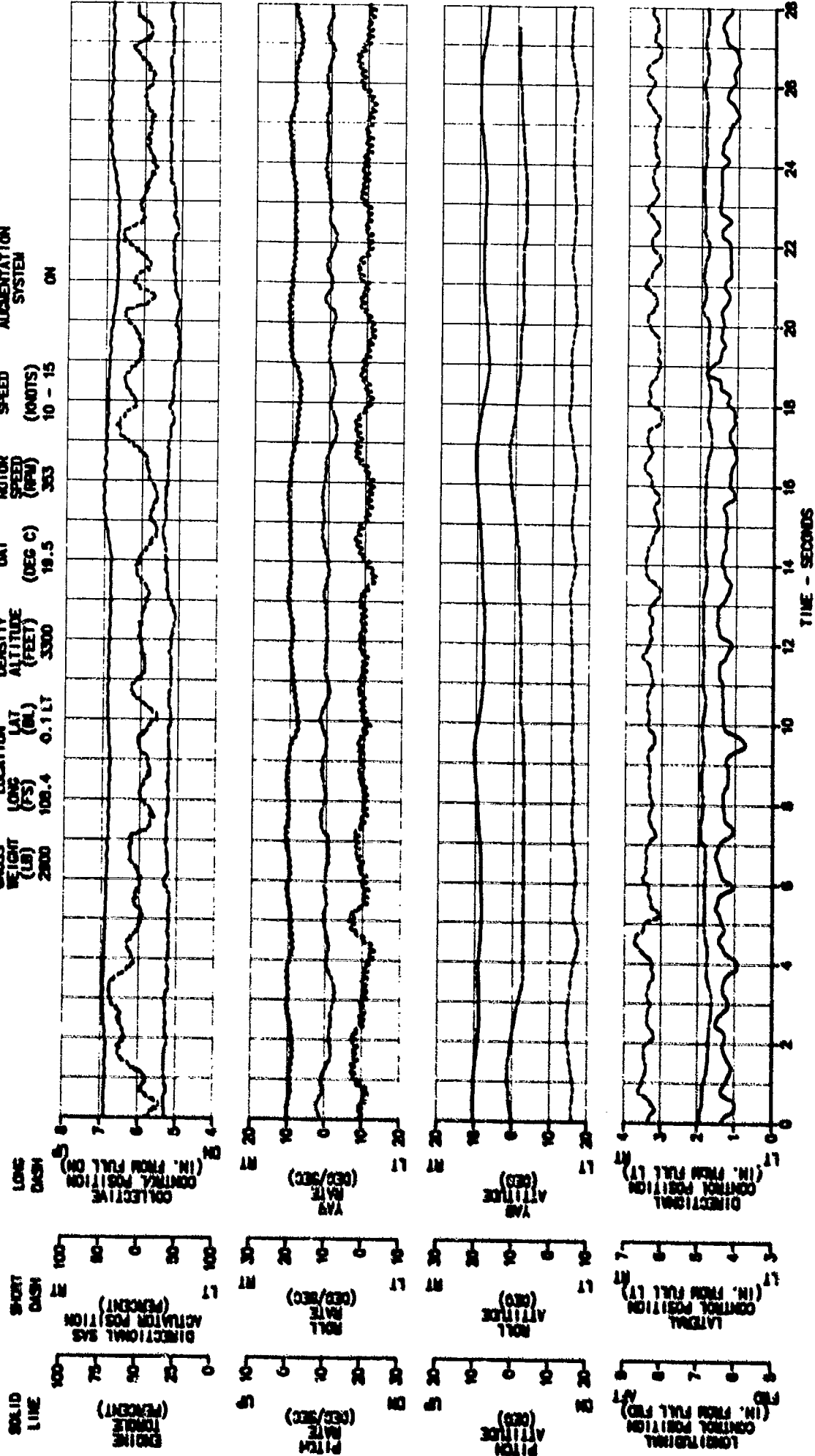


FIGURE E-224
ICE HOWER IN WINDS - 120 DEGREE AZIMUTH
J04-08C USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM
OFF

WIND
SPEED
(KNOTS)
10 - 15

TRIM
ROTOR
SPEED
(RPM)
304

AVG
GAT
(DEG C)
21.0

AVG
DENSITY
ALTITUDE
(FEET)
3470

AVG
CS
LOCATION
(PS)
108.3

AVG
WEIGHT
(LB)
2000

AVG
LAT
(ML)
0.1 LT

LONG
DOWN
(IN. FROM FULL LV)
COLLECTIVE
CONTROL POSITION

LONG
DOWN
(IN. FROM FULL LV)
DIRECTIONAL
CONTROL POSITION

LONG
DOWN
(IN. FROM FULL LV)
DIRECTIONAL
CONTROL POSITION

YAW
RATE
(DEG/SEC)
LT
RT

ROLL
RATE
(DEG/SEC)
LT
RT

PITCH
RATE
(DEG/SEC)
UP
DN

YAW
ATTITUDE
(DEG)
LT
RT

ROLL
ATTITUDE
(DEG)
LT
RT

PITCH
ATTITUDE
(DEG)
UP
DN

LONG
DOWN
(IN. FROM FULL LV)
DIRECTIONAL
CONTROL POSITION

LONG
DOWN
(IN. FROM FULL LV)
DIRECTIONAL
CONTROL POSITION

LONG
DOWN
(IN. FROM FULL LV)
DIRECTIONAL
CONTROL POSITION

TIME - SECONDS

FIGURE E-225
ICE POWER IN WINDS - 150 DEGREE AZIMUTH

AVG ELEVATION (M)	AVG ELEVATION (FT)	AVG LAT (N)	AVG LONG (E)	AVG DENSITY ALTITUDE (FEET)	AVG OAT	TRIM MOTOR SPEED (RPM)	WIND SPEED (KNOTS)	STABILITY ALIGNMENT SYSTEM
2000	6561	0.117	108.3	3470	21.5	351	10 - 15	ON

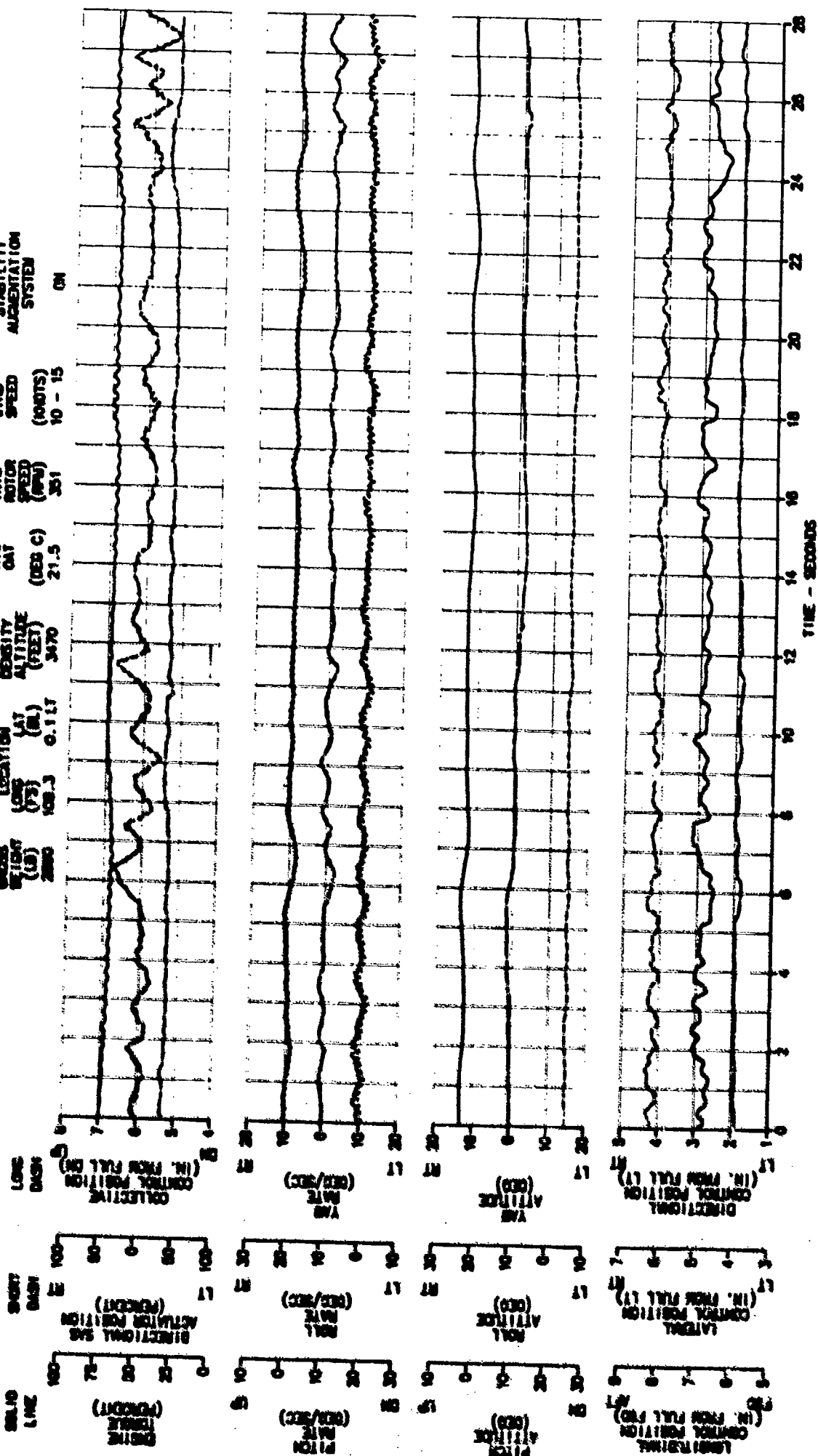


FIGURE E-226

ICE HOVER IN WINDS - 180 DEGREE AZIMUTH

JOH-50C USA S/N 70-15349

AVG GROSS WEIGHT (LB)	2650	AVG LOCATION LONG (FS)	108.3	AVG CO LAT (BL)	0.1 LT	AVG DENSITY ALTITUDE (FEET)	3410	AVG OAT (DEG C)	21.0	TRIM ROTOR SPEED (RPM)	354	WIND SPEED (KNOTS)	10 - 15	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	------------------------	-------	-----------------	--------	-----------------------------	------	-----------------	------	------------------------	-----	--------------------	---------	-------------------------------	----

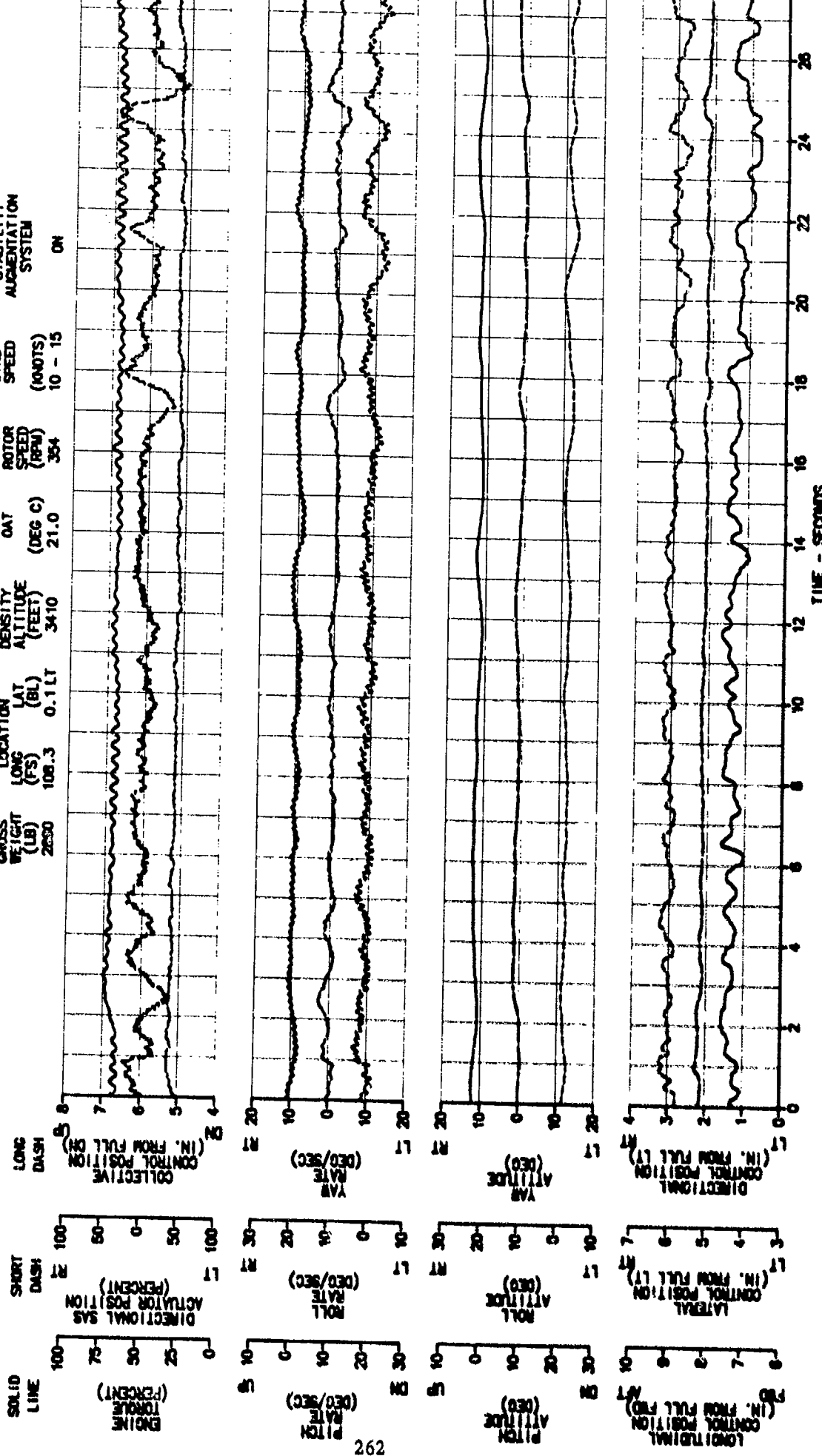


FIGURE E-227

ICE HOWER IN WINDS - 180 DEGREE AZIMUTH

JOH-58C USA S/N 70-15349

AVG CROSS WEIGHT (LB)	2000	AVG OR LONG (FT)	108.3	LAT (BL)	0.117	DENSITY	- 2880	AVG OAT (DEG C)	20.5	TRIM MOTOR SPEED (RPM)	351	BIND SPEED (KNOTS)	10 - 15	STABILITY AUGMENTATION SYSTEM	OFF
-----------------------	------	------------------	-------	----------	-------	---------	--------	-----------------	------	------------------------	-----	--------------------	---------	-------------------------------	-----

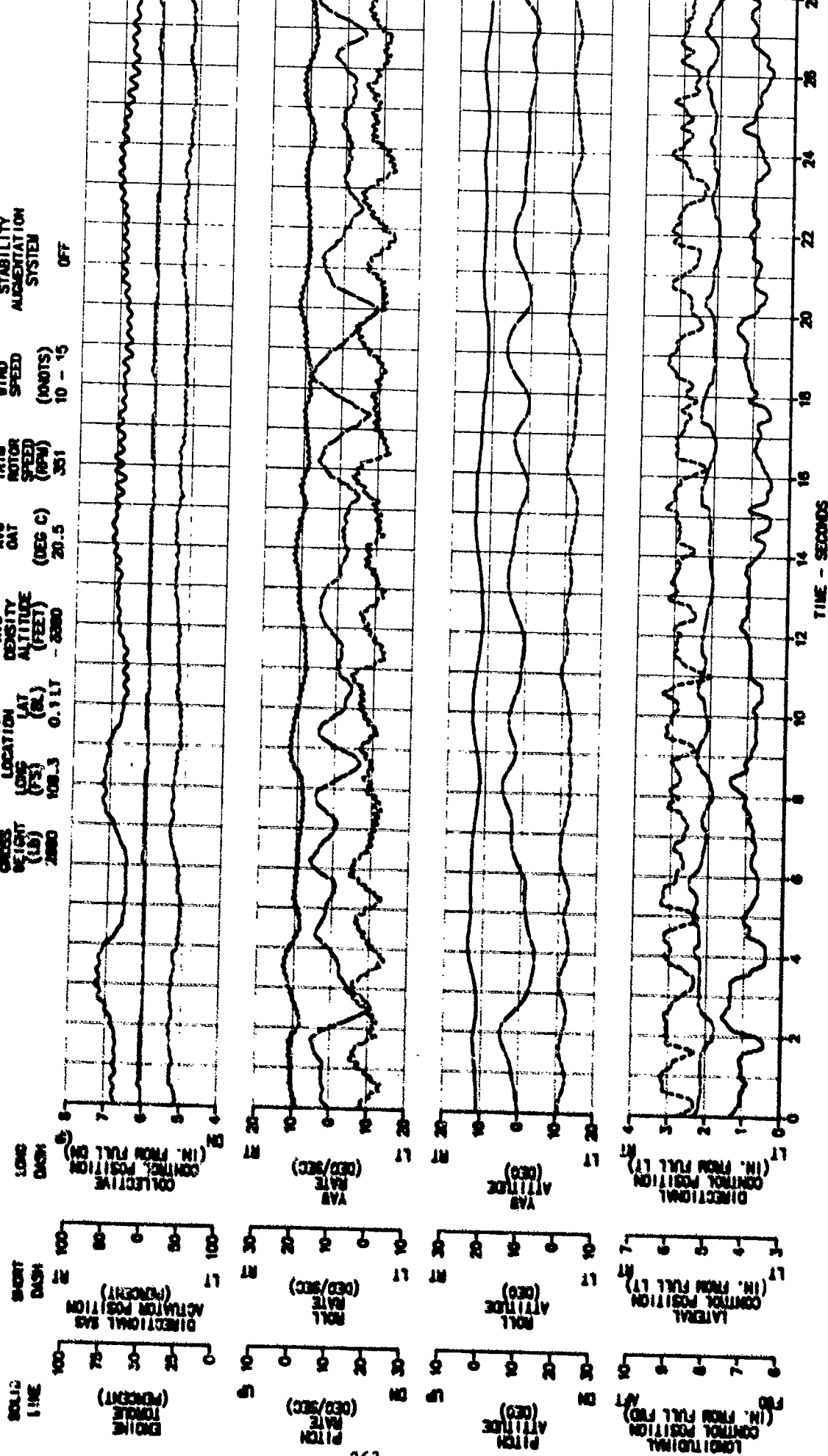


FIGURE E-228
ICE MOVER IN WINDS - 210 DEGREE AZIMUTH

JOH-58C USA S/N 70-15349
 AVG CROSS WEIGHT (LB) 2880
 AVG CB LONG (FS) 108.3
 LAT (BL) 0.1 LT
 AVG DENSITY ALTITUDE (FEET) 3420
 AVG DAT (DEG C) 21.0
 TRIM MOTOR SPEED (RPM) 355
 BIND SPEED (KNOTS) 10 - 15
 STABILITY AUGMENTATION SYSTEM ON

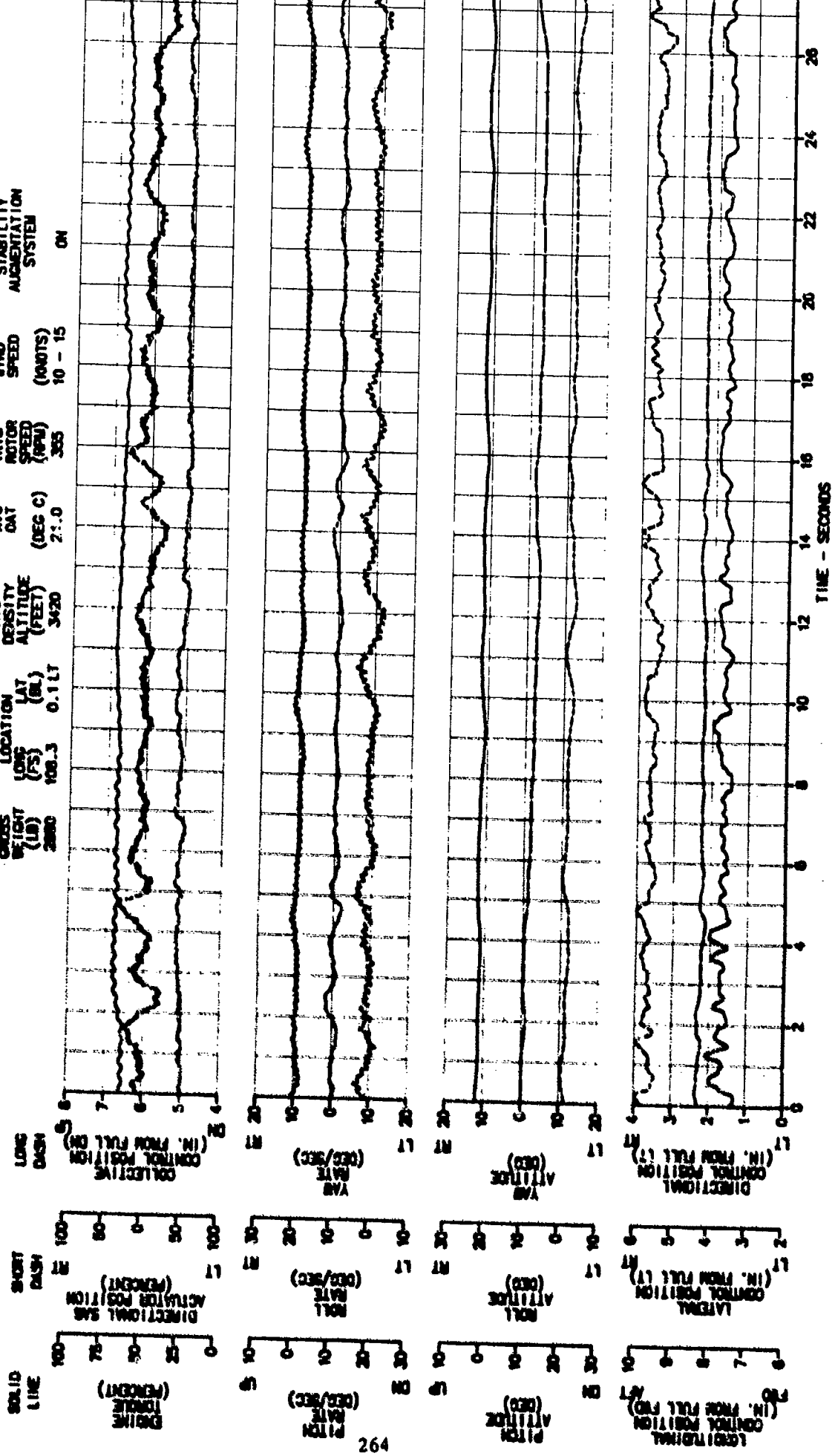


FIGURE E-229

ICE HOVER IN WINDS - 210 DEGREE AZIMUTH

JOH-ONE USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM

OFF

WIND
SPEED
(KNOTS)
10 - 15

TRIM
ROTOR
SPEED
(RPM)
353

Avg OAT
(DEG C)
21.0

Avg ALTITUDE
(FEET)
3430

Avg CR
LONG
(°S)
108.3

Avg LAT
(°N)
0.117

Avg CROSS
HEIGHT
(FT)
2860

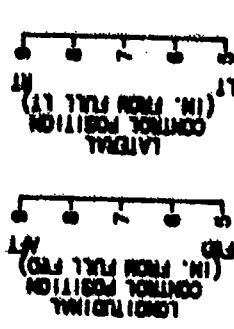
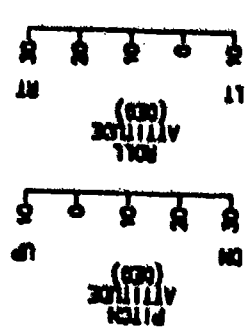
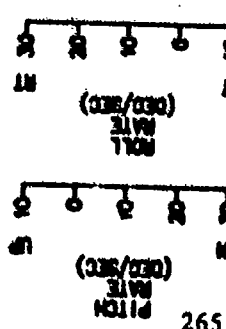
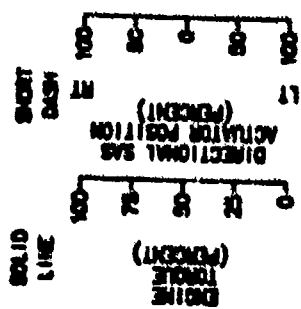
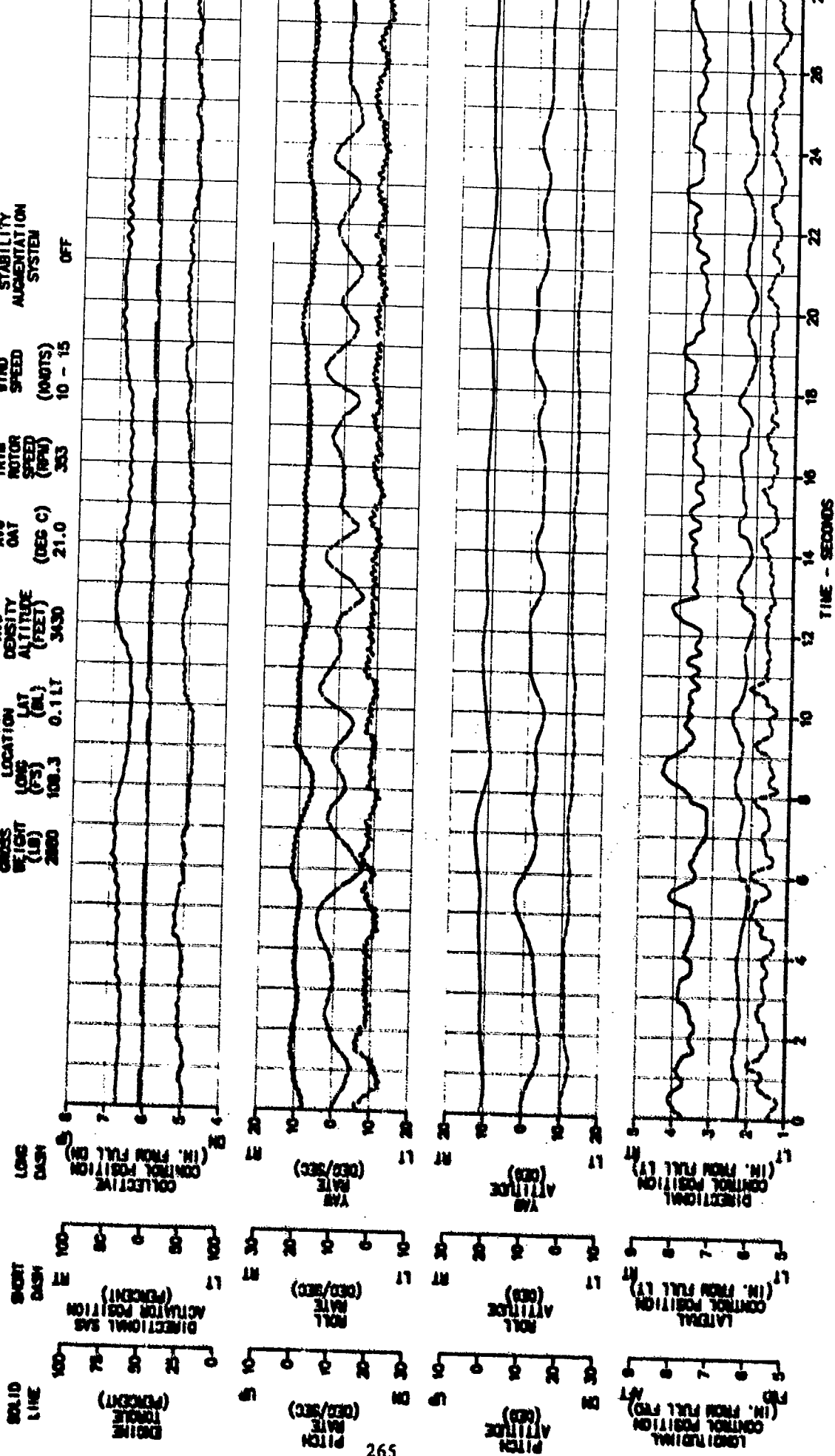


FIGURE E-230

ICE HOVER IN WINDS - 240 DEGREE AZIMUTH

JOH-58C USA S/N 70-15349

AVG GROSS WEIGHT (LB)	2000	AVG CB LONG (F5)	109.3	AVG CB LAT (BL)	0.1 LT	AVG DENSITY ALTITUDE (FEET)	3410	AVG OAT (DEG C)	20.5	TRIM ROTOR SPEED (RPM)	303	WIND SPEED (KNOTS)	10 - 15	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	------------------	-------	-----------------	--------	-----------------------------	------	-----------------	------	------------------------	-----	--------------------	---------	-------------------------------	----

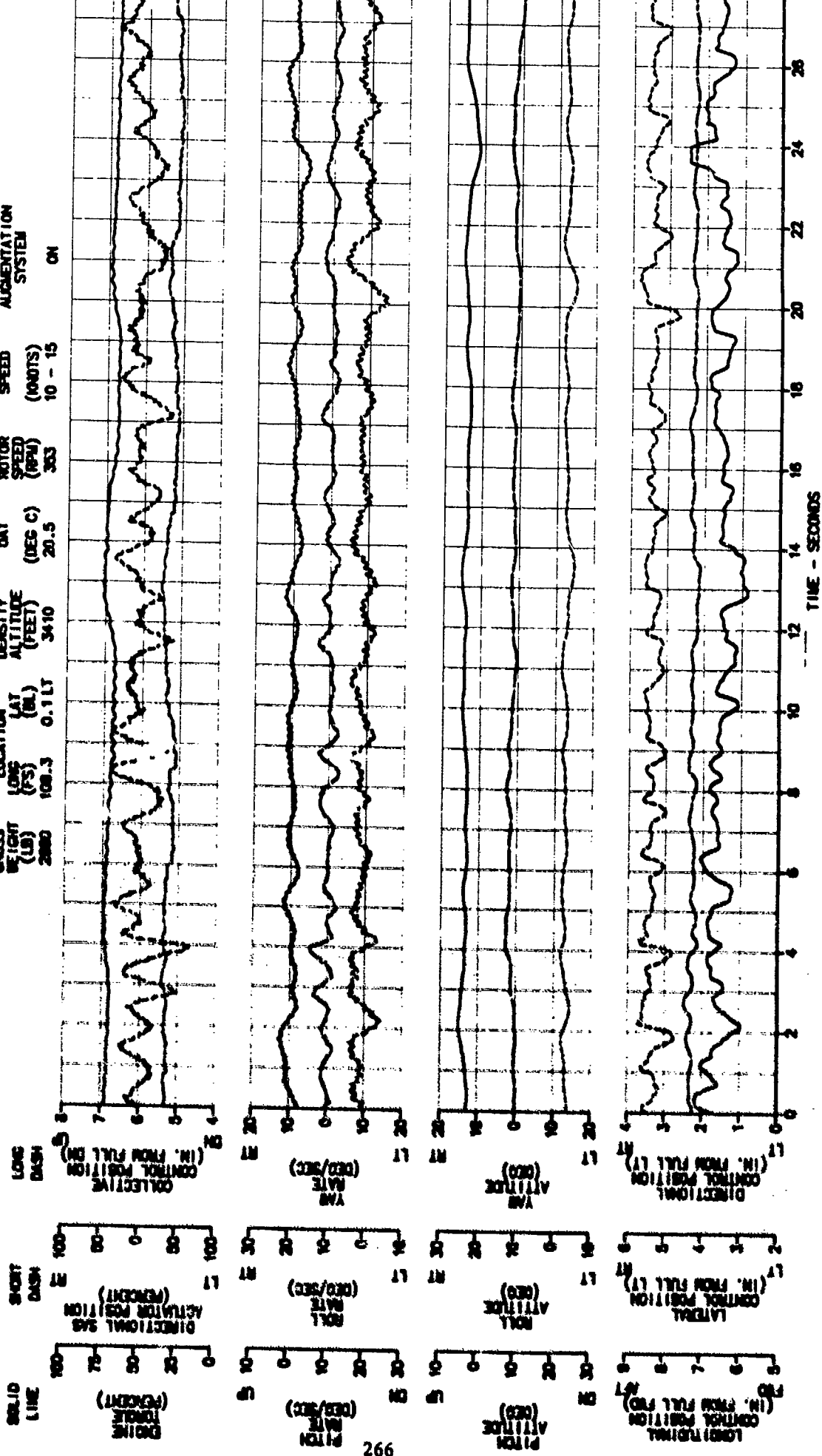


FIGURE E-231

ICE HOVER IN WINDS - 240 DEGREE AZIMUTH

JOH-58C USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM
OFF

WIND
SPEED
(KNOTS)
10 - 15

TRIM
ROTOR
SPEED
(RPM)
350

AVG
OAT
(DEG C)
20.0

AVG
DENSITY
ALTITUDE
(FEET)
3300

AVG CR
LOCATION
LAT
(BL)
0.1 LT

AVG
LONG
(FS)
108.3

AVG
GROSS
WEIGHT
(LB)
2870

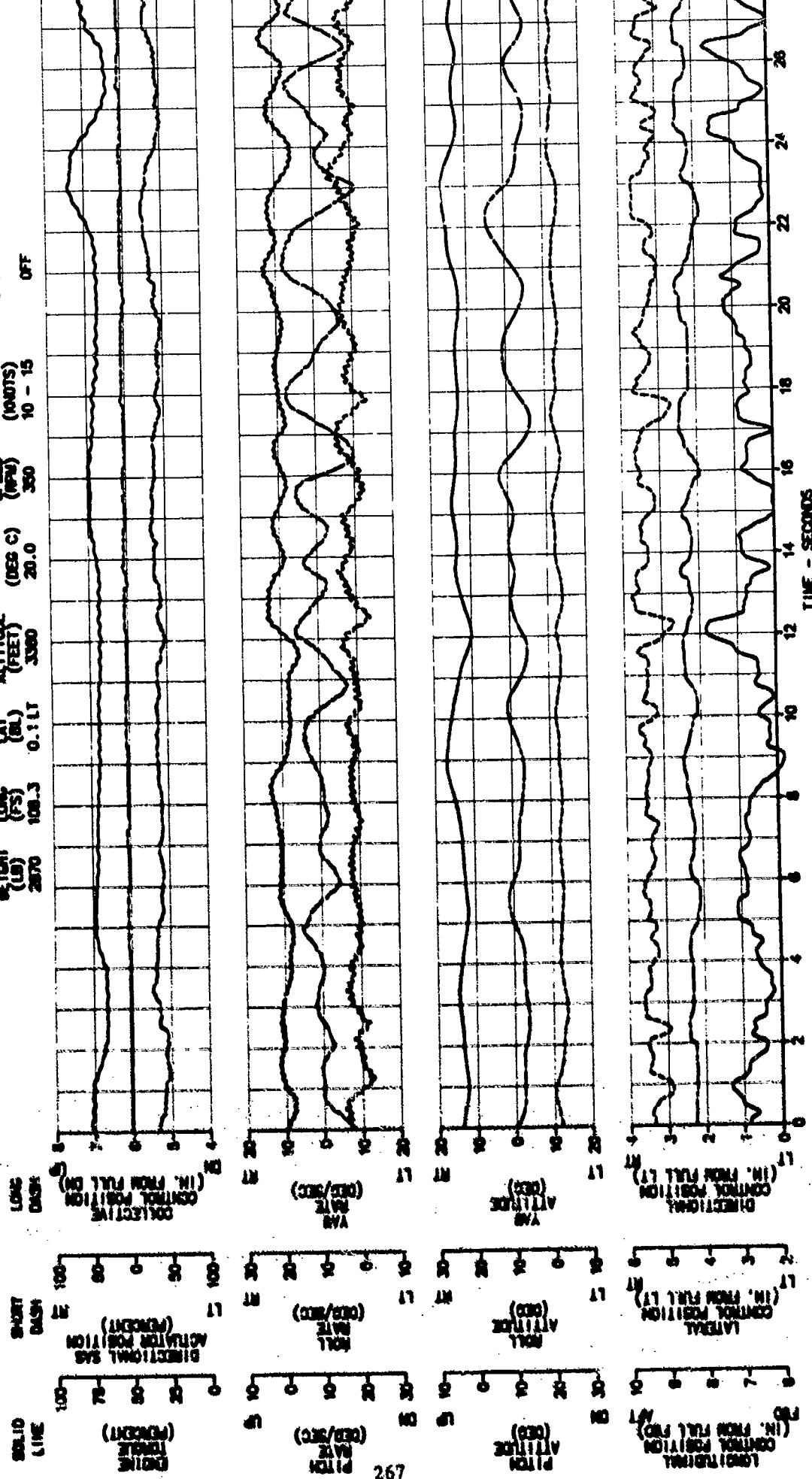


FIGURE E-232

ICE HOVER IN WINDS - 270 DEGREE AZIMUTH

J04-58C USA S/N 70-15349

Avg	Avg	Avg	TRIM	WIND	STABILITY
CROSS	CG	DENSITY	ROTOR	SPEED	AUGMENTATION
WEIGHT	LOCATION	ALTITUDE	SPEED	(KNOTS)	SYSTEM
(LB)	(FS)	(FEET)	(RPM)	10 - 15	ON
2670	108.3	3230	365		
	0.1 LT				

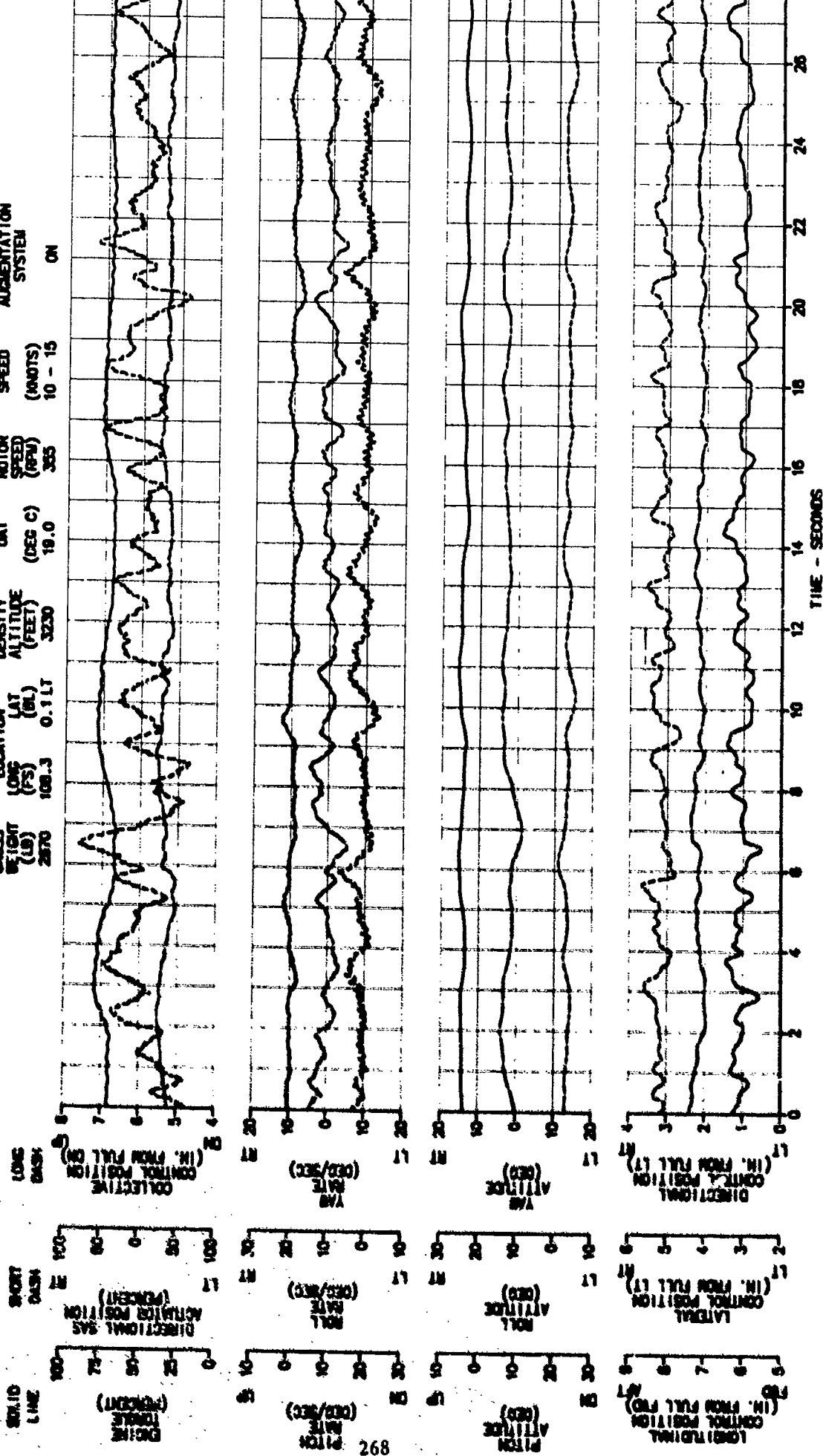


FIGURE E-233
ICE HOVER IN WINDS - 270 DEGREE AZIMUTH

JOM-88C USA S/N 70-15348
WIND SPEED (KNOTS) 10 - 15
STABILITY AUGMENTATION SYSTEM OFF
AVG CROSS WEIGHT (LB) 2870
AVG CR LOCATION LONG (FS) 108.3 LAT (DL) 0.1 LT
AVG DENSITY ALTITUDE (FEET) 3150
AVG OAT (DEG C) 18.5
TRAIN MOTOR SPEED (RPM) 351

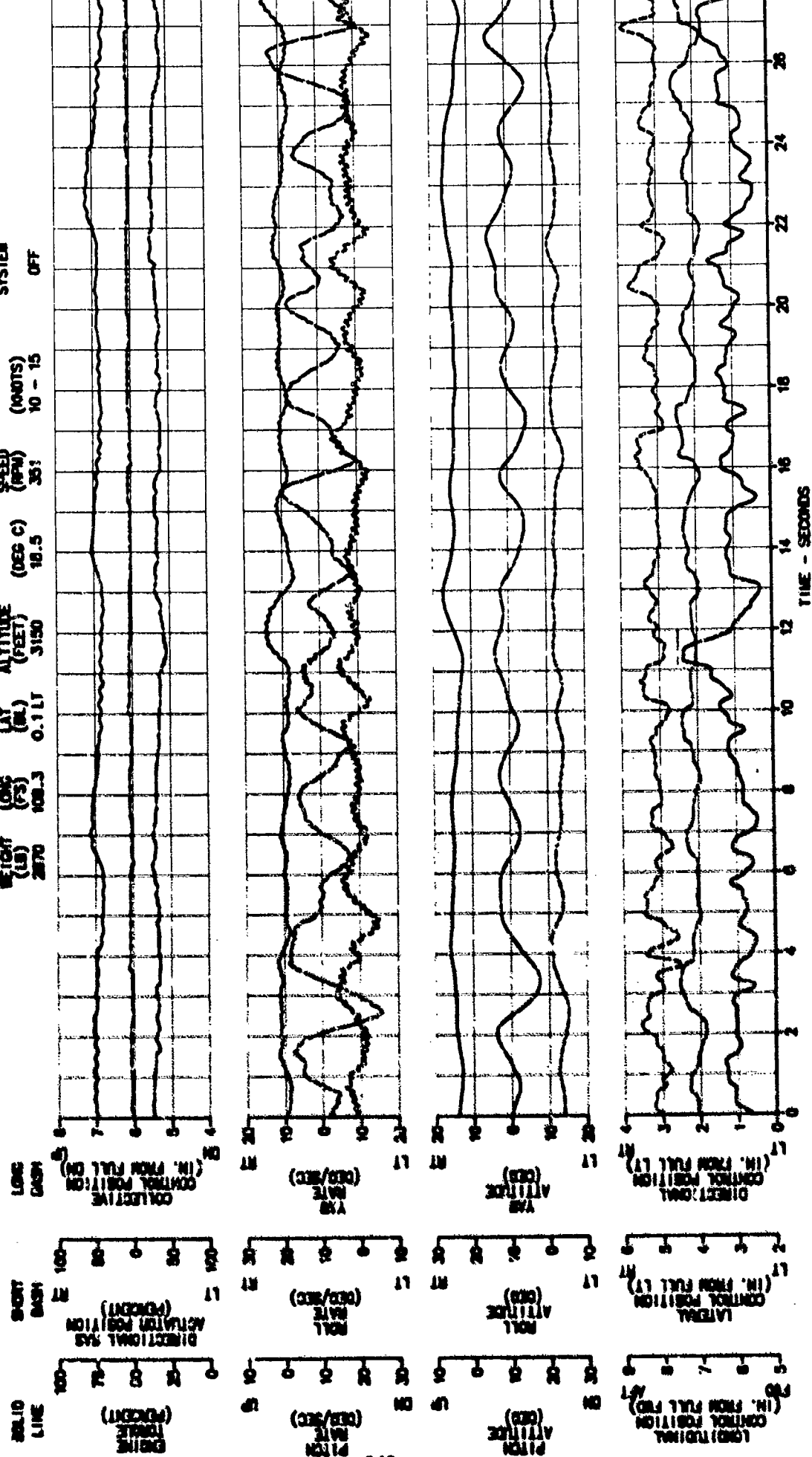


FIGURE E-234

ICE HOWER IN WINDS - 280 DEGREE AZIMUTH

JOM-20C USA S/N 70-15348

Avg Gross Weight (LB)	2800	Avg CS Location	109.3	Lat (BL)	0.117	Avg Density	17.0	Trim Motor Speed (RPM)	303	Wind Speed (KNOTS)	10 - 15	Stability Augmentation System	ON
Avg Altitude (FEET)	3000												

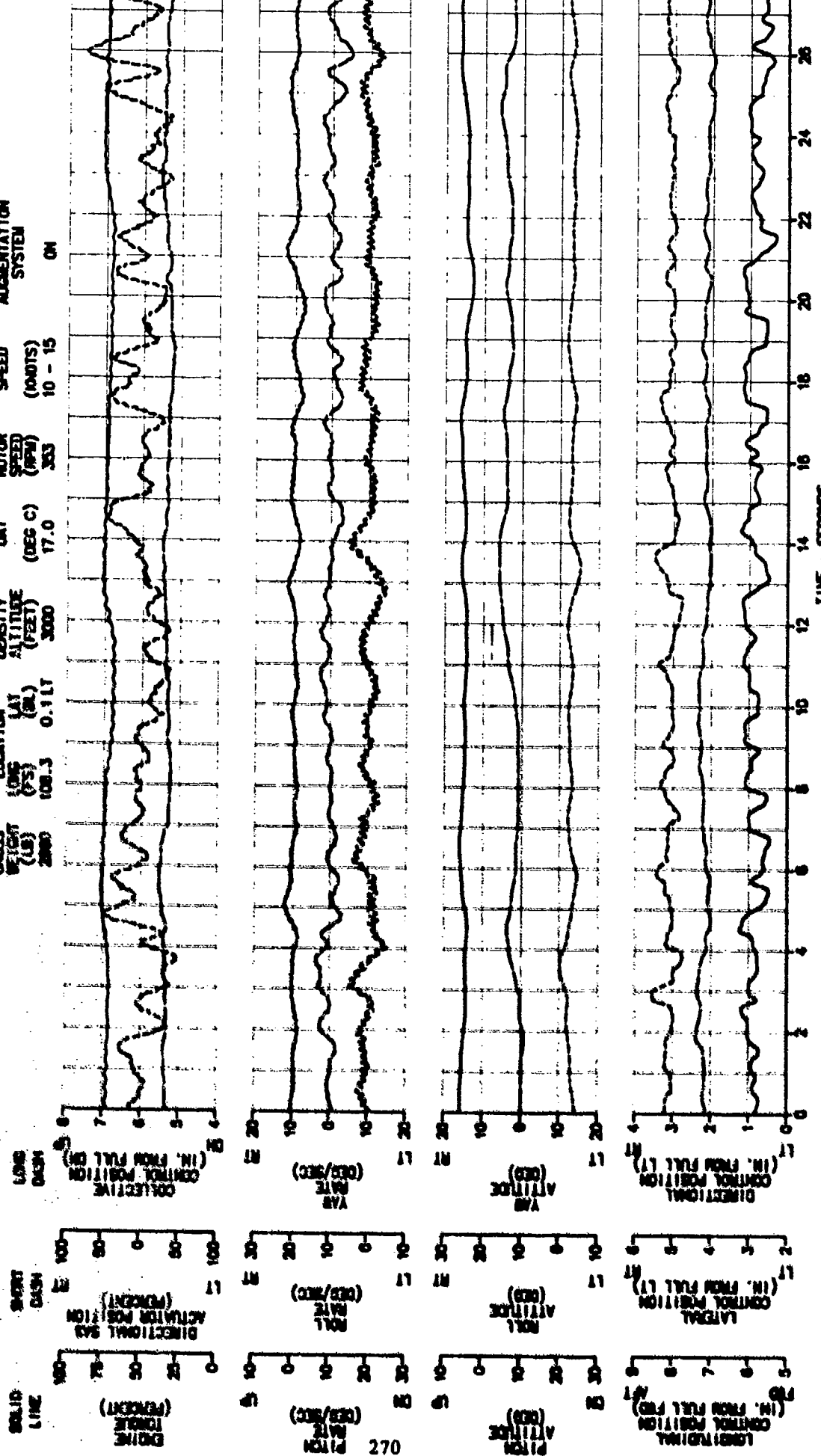


FIGURE E-235

ICE HOVER IN WINDS - 280 DEGREE AZIMUTH

JOH-ONE USA S/N 70-15348

STABILITY
AUGMENTATION
SYSTEM
OFF

WIND
SPEED
(KNOTS)
10 - 15

TRIM
MOTOR
SPEED
(RPM)
352

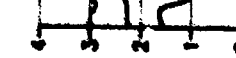
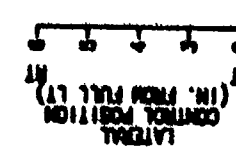
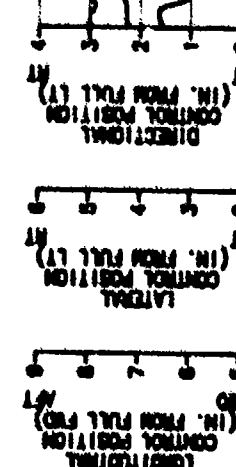
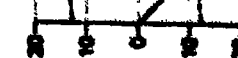
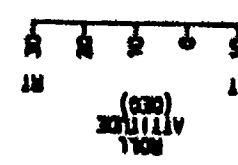
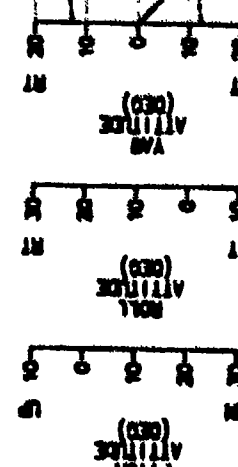
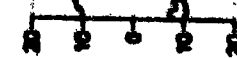
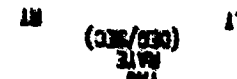
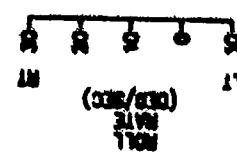
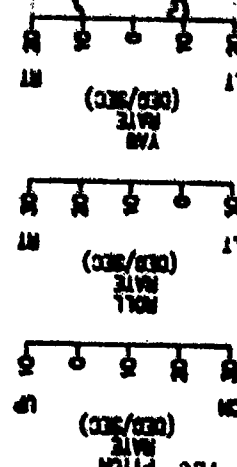
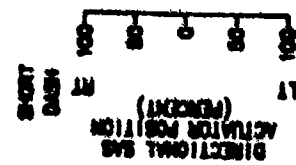
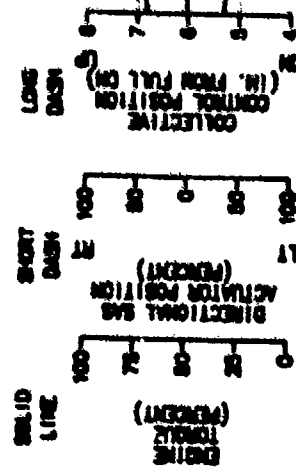
AVG
OAT
(DEG C)
17.0

AVG
DENSITY
ALTITUDE
(FEET)
2850

AVG CB
LOCATION
LAT
(N)
0.1 LT

AVG
LONG
(PS)
108.3

AVG
WEIGHT
(LB)
2880



TIME - SECONDS

FIGURE E-236
ICE HOVER IN WINDS - 290 DEGREE AZIMUTH

JOHN-58C USA S/N 70-15349

**STABILITY
AUGMENTATION
SYSTEM**

WIND SPEED (KNOTS)	WIND DIRECTION	WAVE PERIOD (SECS)	WAVE HEIGHT (FEET)	WAVE LENGTH (FEET)	WAVE DIRECTION	WAVE PERIOD (SECS)	WAVE HEIGHT (FEET)	WAVE LENGTH (FEET)	WAVE DIRECTION
10	100	10	10	100	100	10	10	100	100
15	100	10	10	100	100	10	10	100	100
20	100	10	10	100	100	10	10	100	100
25	100	10	10	100	100	10	10	100	100
30	100	10	10	100	100	10	10	100	100
35	100	10	10	100	100	10	10	100	100
40	100	10	10	100	100	10	10	100	100
45	100	10	10	100	100	10	10	100	100
50	100	10	10	100	100	10	10	100	100
55	100	10	10	100	100	10	10	100	100
60	100	10	10	100	100	10	10	100	100
65	100	10	10	100	100	10	10	100	100
70	100	10	10	100	100	10	10	100	100
75	100	10	10	100	100	10	10	100	100
80	100	10	10	100	100	10	10	100	100
85	100	10	10	100	100	10	10	100	100
90	100	10	10	100	100	10	10	100	100
95	100	10	10	100	100	10	10	100	100
100	100	10	10	100	100	10	10	100	100

Avg		TRIM
DAT		MOTOR
		SPEED
		(RPM)
DEG C)		

AVG
DAT

NOTATION (ML)

NOTATION (ML)

**AVC
EIGHT
(19)**

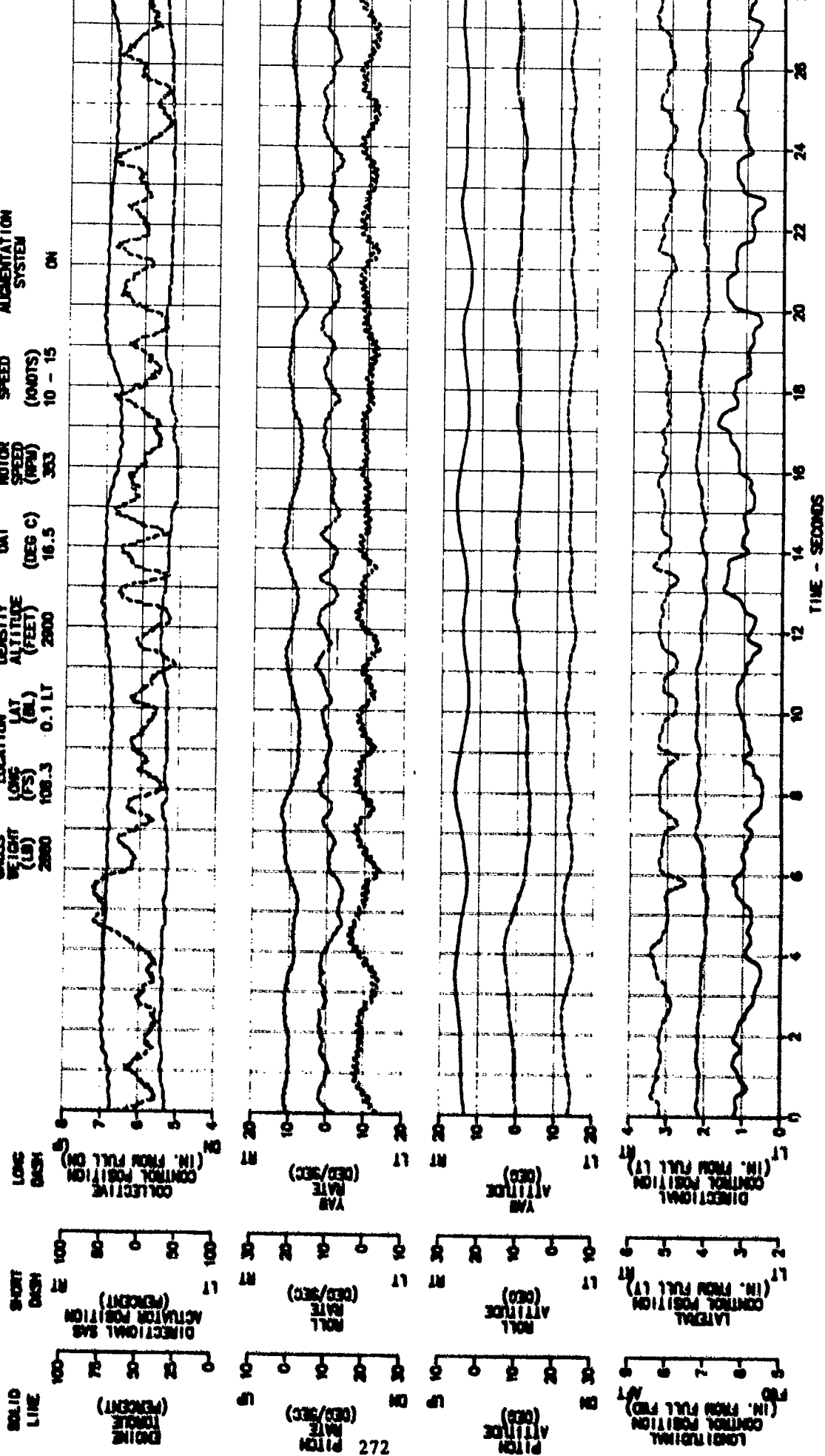


FIGURE E-237
ICE HOVER IN WINDS - 290 DEGREE AZIMUTH

JH-88L USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM
OFF

WIND
SPEED
(KNOTS)
10 - 15

TRIM
MOTOR
SPEED
(RPM)
356

AVG
OAT
(DEG C)
16.5

AVG
DENSITY
ALTITUDE
(FEET)
2880

AVG CG
LAT
(ML)
0.1 LT

AVG CG
LONG
(FS)
108.3

AVG
WEIGHT
(LB)
2880

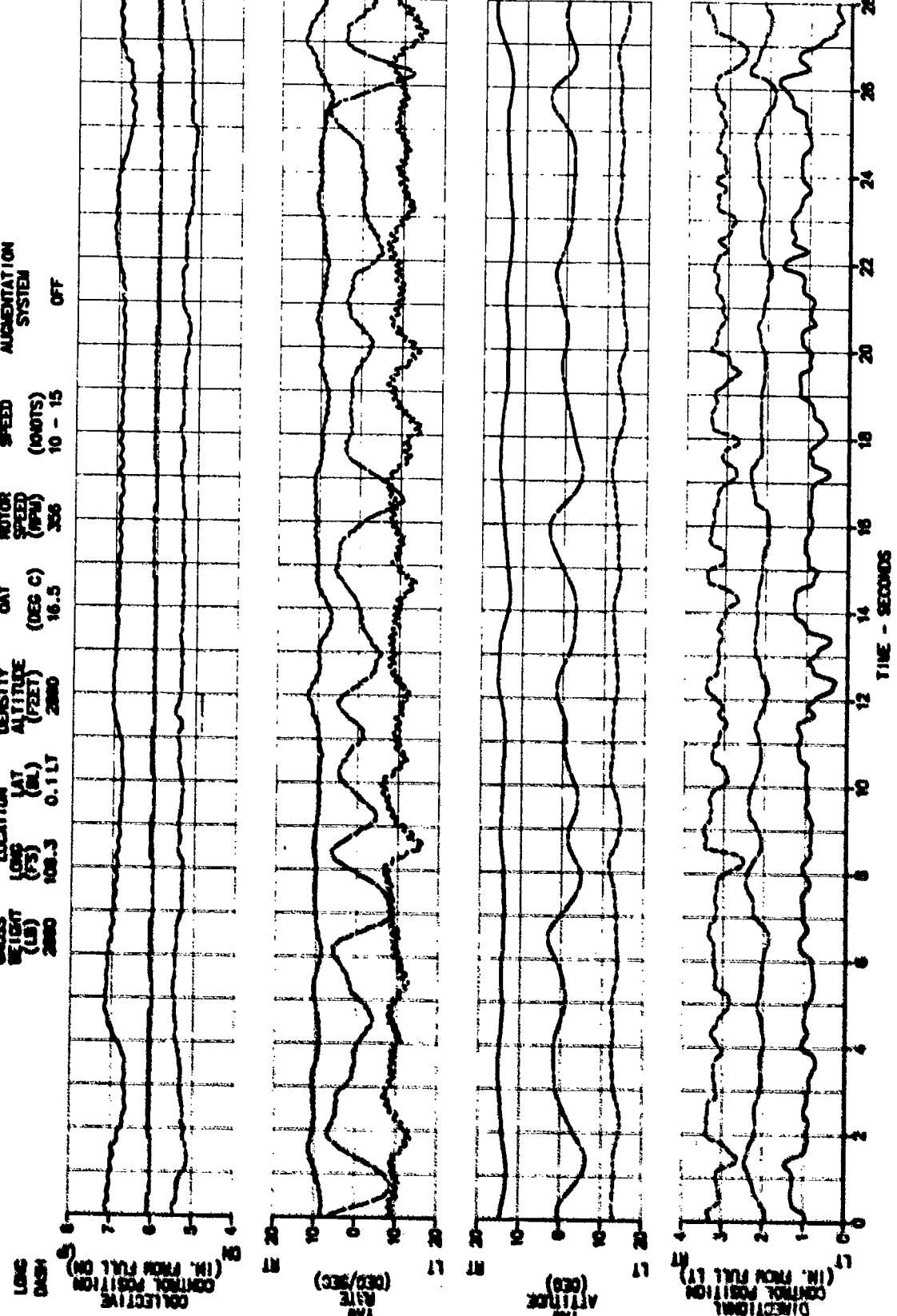
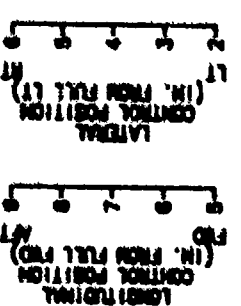
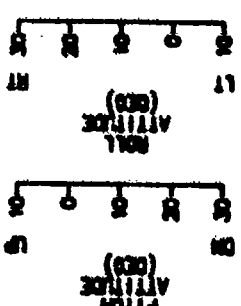
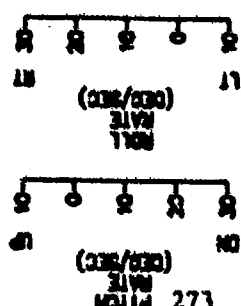
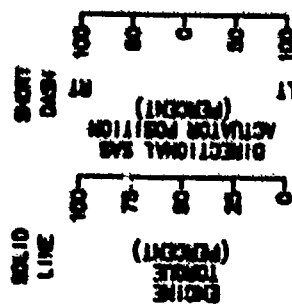


FIGURE E-238
ICE HOVER IN BINDS - 300 AZIMUTH

JOM-300 USA S/N 70-13348
AVG CRGS WEIGHT (LB) 2800
AVG CS LONG (FT) 108.3
AVG CS LAT (ML) 0.1 LT
AVG DENSITY (DEG C) 16.5
AVG OAT (DEG C) 16.5
TRIM ROTOR SPEED (RPM) 353
BIND SPEED (KNOTS) 10 - 15
STABILITY AUGMENTATION SYSTEM ON

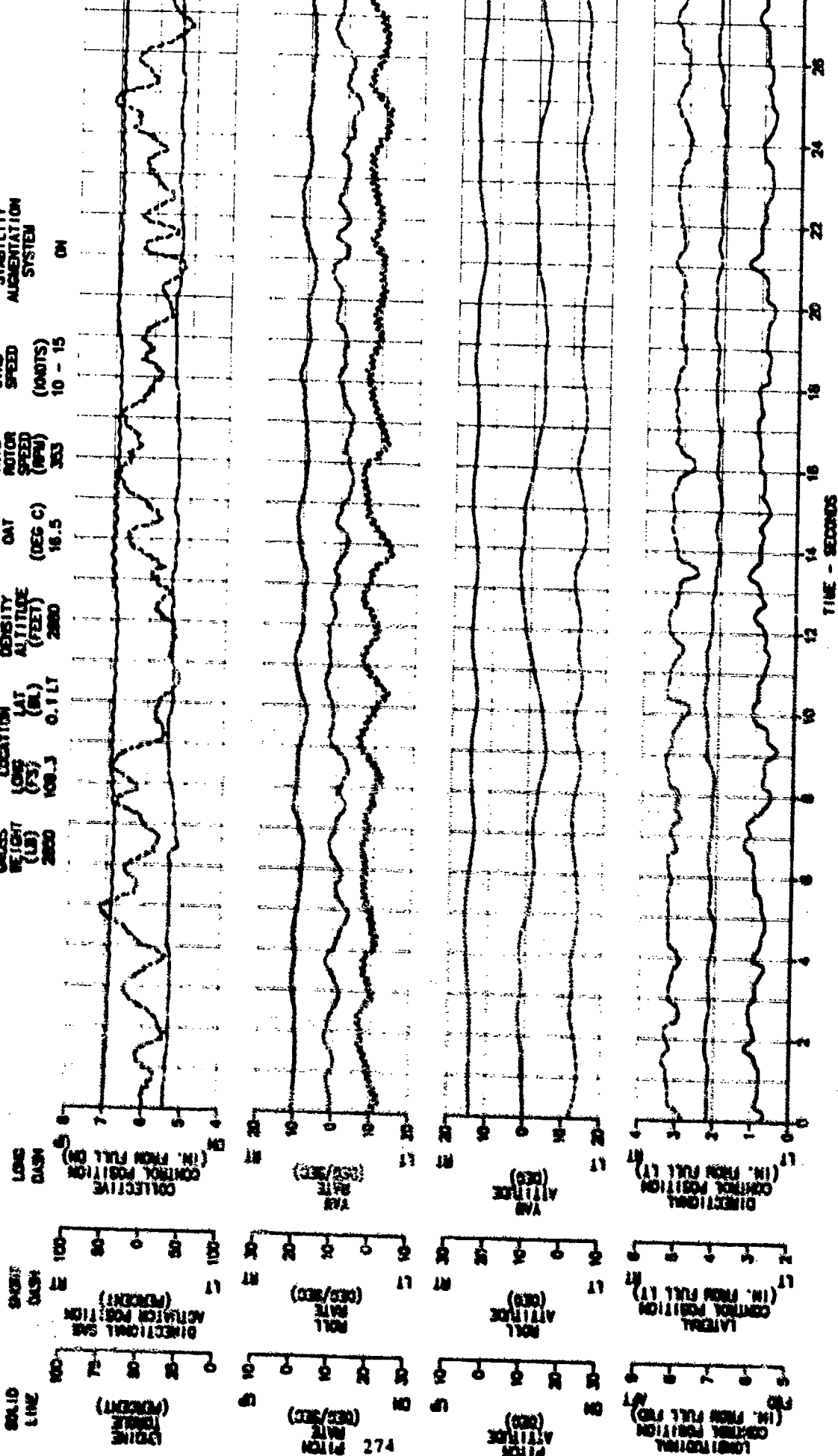


FIGURE E-239
ICE HOVER IN WINDS - 300 DEGREE AZIMUTH

JOH-ONE USA S/N 70-15348

AVG CROSS HEIGHT (LB)	AVG CS LOCATION (FT)	AVG DENSITY (G)	AVG DAY	TRIM MOTOR SPEED (RPM)	WIND SPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM
3850	108.3	0.11	16.5	304	10 - 15	OFF

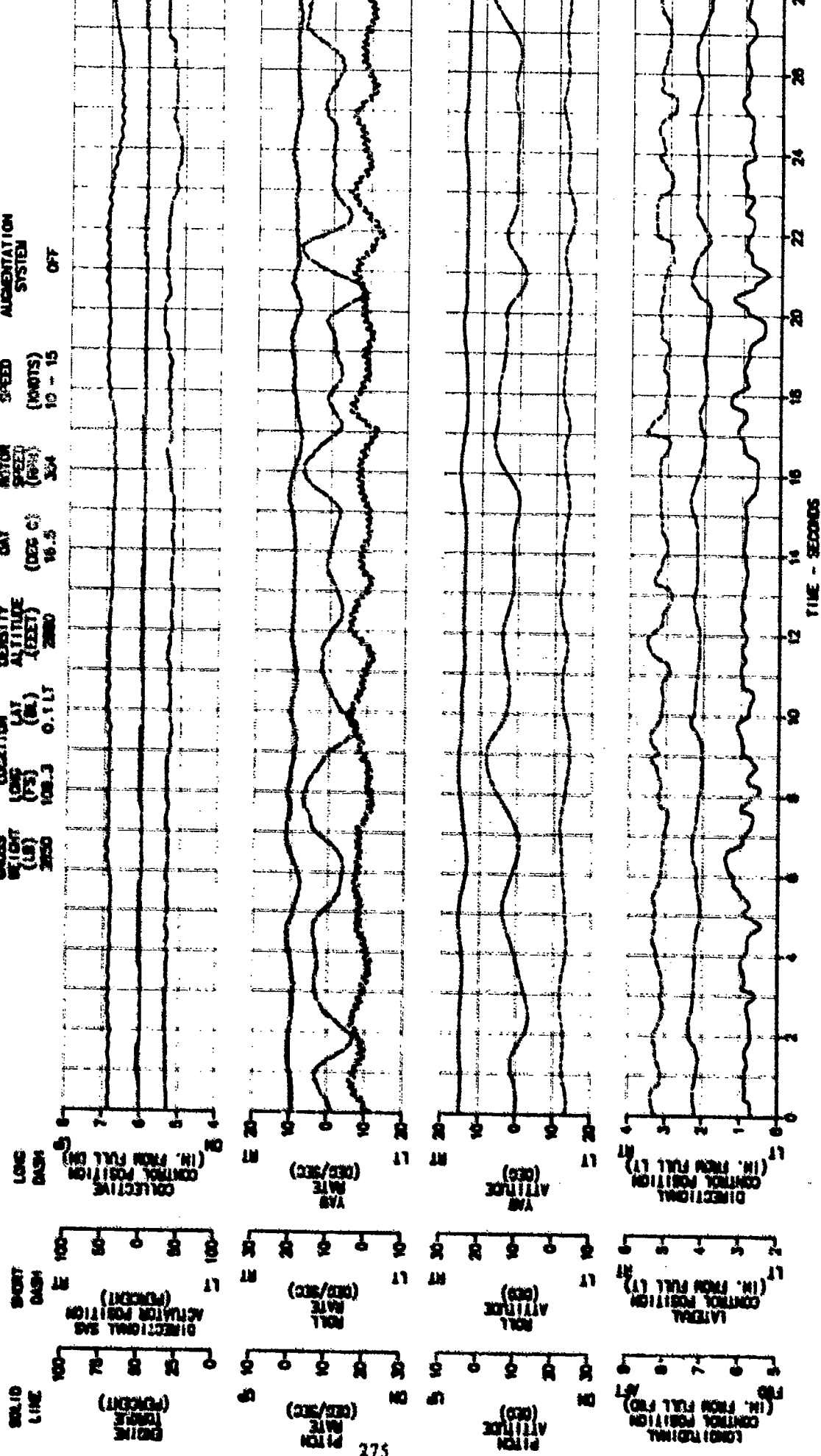


FIGURE E-240
ICE HOVER IN WINDS - 300 DEGREE AZIMUTH

J04-56C USA S/N 70-15349

AVG GROSS WEIGHT (LB)	2780	AVG CS LOCATION	LONG (FS)	108.1	LAT (BL)	0.0	AVG DENSITY ALTITUDE (FEET)	2870	AVG OAT (DEG C)	14.5	TRIM ROTOR SPEED (RPM)	353	WIND SPEED (KNOTS)	23 - 36	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	-----------------	-----------	-------	----------	-----	-----------------------------	------	-----------------	------	------------------------	-----	--------------------	---------	-------------------------------	----

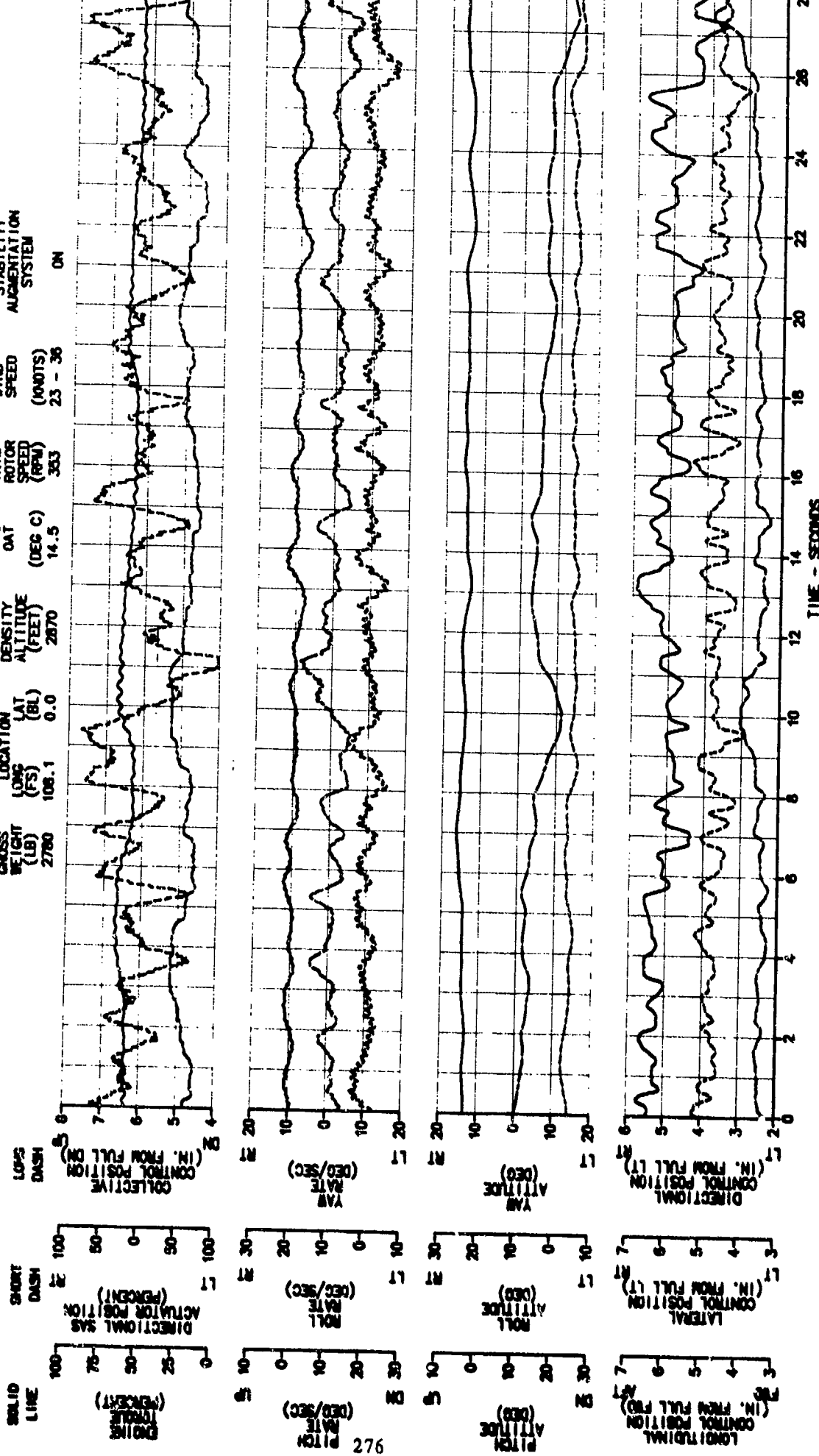


FIGURE E-241
ICE HOVER IN WINDS - 320 DEGREE AZIMUTH

JOH-500 USA S/N 70-15349
WIND SPEED (KNOTS) 23 - 36
STABILITY AUGMENTATION SYSTEM ON
AVG GROSS WEIGHT (LB) 2780
AVG LOCATION LONG (FS) 108.2 LAT (BL) 0.0
AVG ALTITUDE (FEET) 2820
AVG OAT (DEG C) 14.0
TRIM ROTOR SPEED (RPM) 353

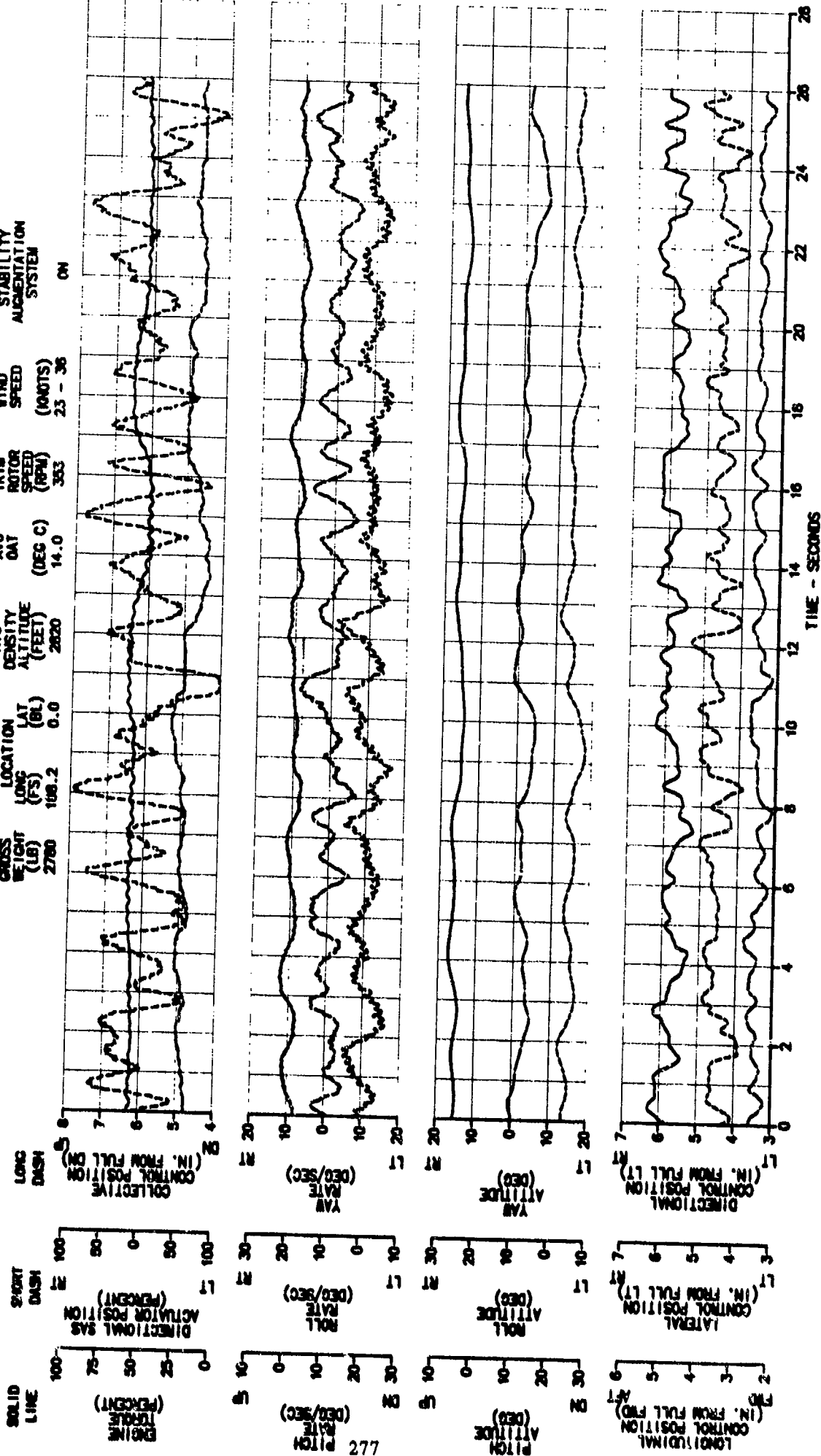


FIGURE E-242

LEFT ICE HOVER TURN
JON-58C USA S/N 70-15349

AVG GROSS WEIGHT (LB) 2840
AVG CG LONG (FS) 108.2
AVG CG LAT (BL) 0.1 LT
AVG DENSITY ALTITUDE (FEET) 2830
AVG OAT (DEG C) 16.5
TRIM ROTOR SPEED (RPM) 357
WIND SPEED (KNOTS) 10 - 15
STABILITY AUGMENTATION SYSTEM ON

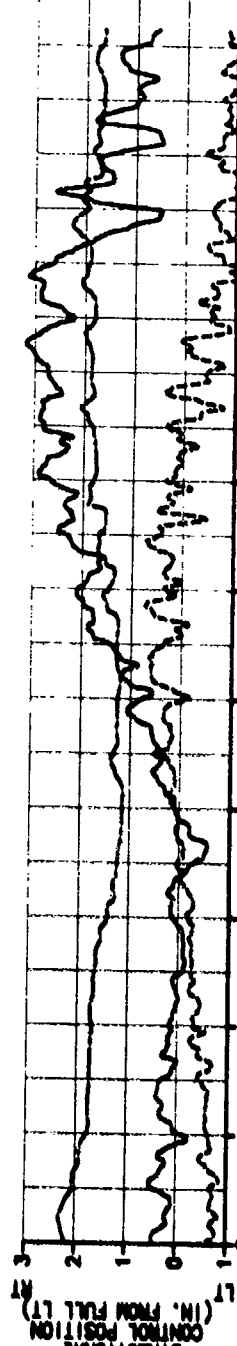
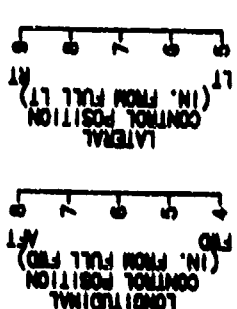
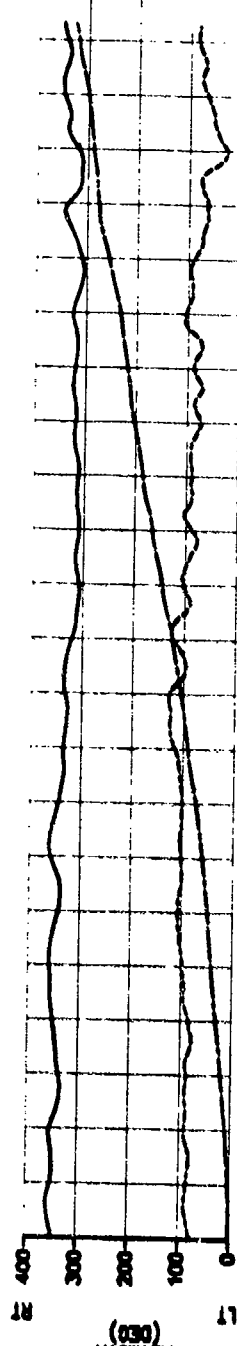
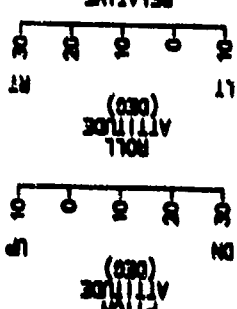
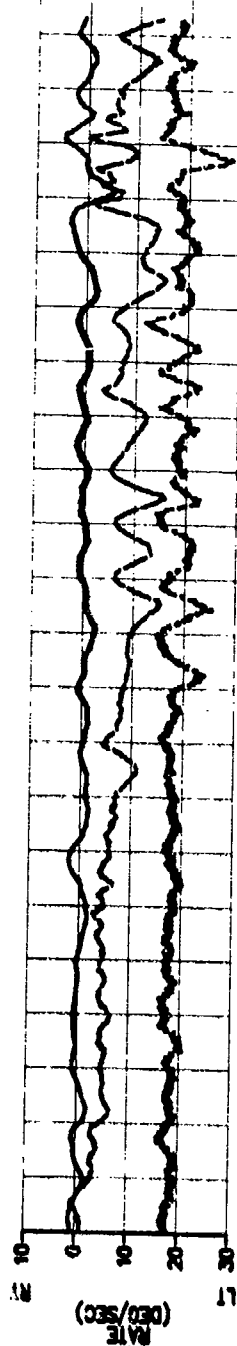
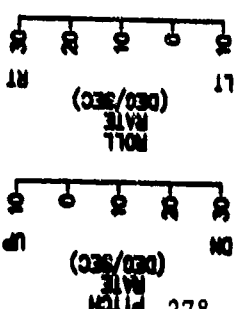
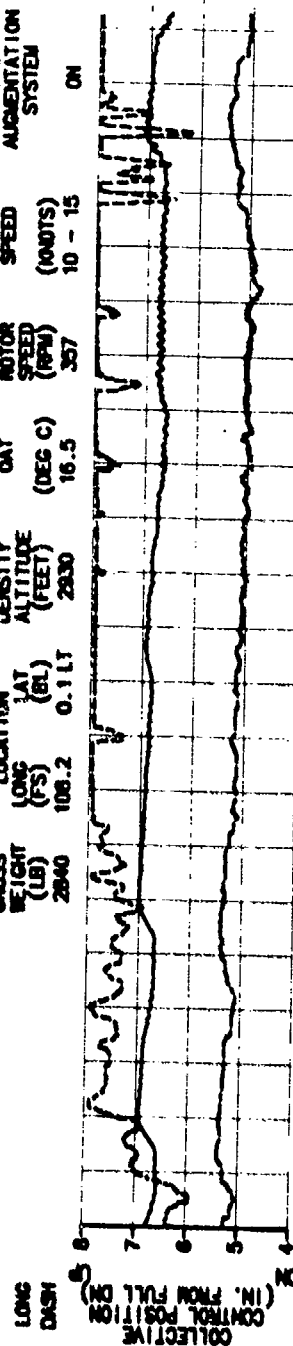
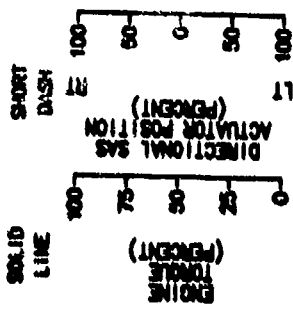


FIGURE E-243

LEFT ICE HOVER TURN

JOM-58C USA S/N 70-15349

AVG
GROSS
WEIGHT
(LB)
2040

AVG CG
LOCATION
LONG (FS)
106.2

AVG
DENSITY
ALTITUDE
(FEET)
3000

AVG
OAT
(DEG C)
17.0

TRIM
ROTOR
SPEED
(RPM)
352

WIND
SPEED
(KNOTS)
10 - 15

STABILITY
AUGMENTATION
SYSTEM
OFF

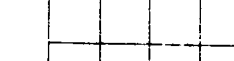
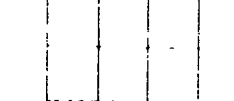
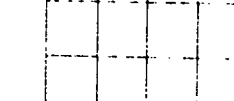
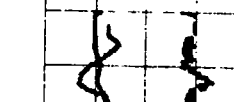
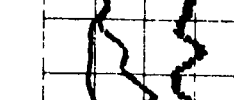
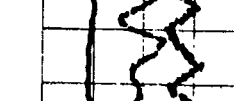
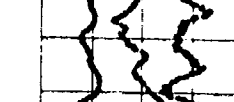
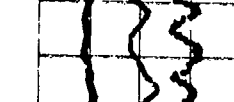
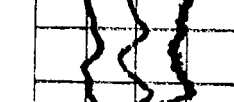
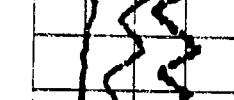
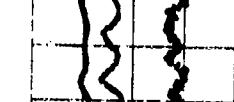
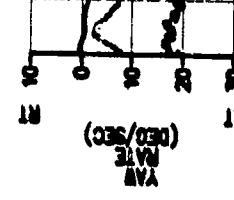
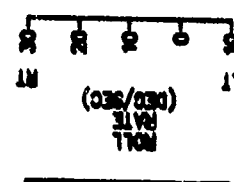
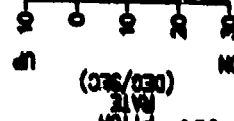
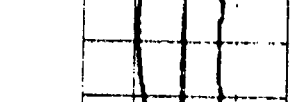
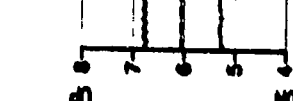
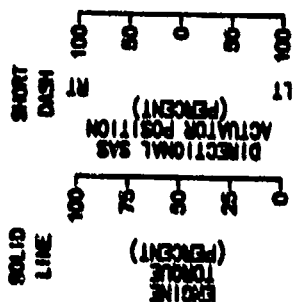


FIGURE E-244

LEFT ICE HOVER TURN

JON-56C USA S/N 70-15349

AVG GROSS WEIGHT (LB)	2840	AVG CS LONG (FS)	108.2	AVG CS LAT (ML)	0.1 LT	DENSITY ALTITUDE (FEET)	2940	AVG OAT (DEG C)	16.5	TRIM Rotor SPEED (RPM)	353	WIND SPEED (KNOTS)	10 - 15	STABILITY AUGMENTATION SYSTEM	ON
-----------------------	------	------------------	-------	-----------------	--------	-------------------------	------	-----------------	------	------------------------	-----	--------------------	---------	-------------------------------	----

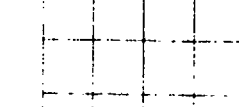
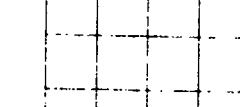
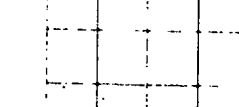
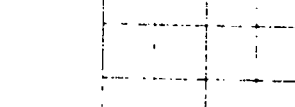
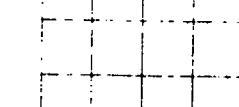
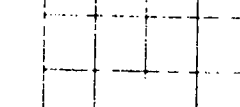
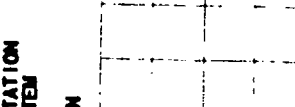
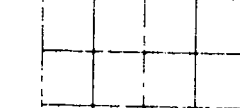
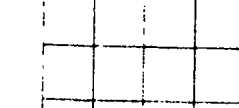
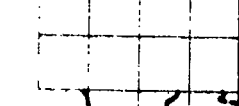
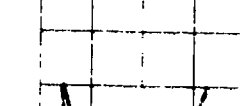
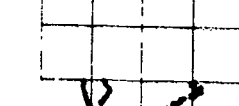
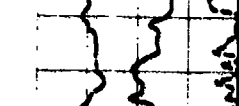
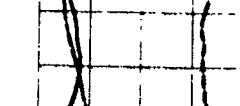
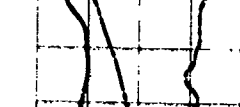
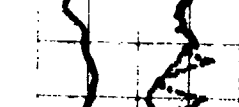
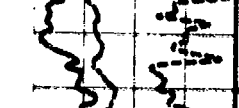
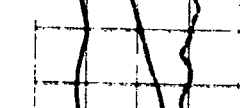
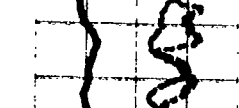
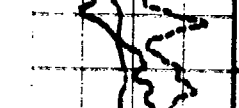
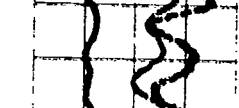
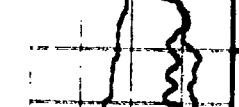
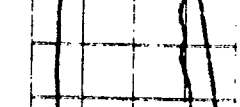
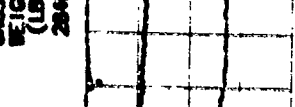
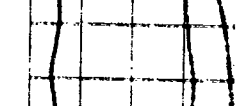
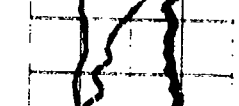
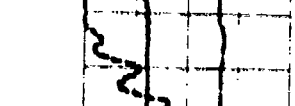
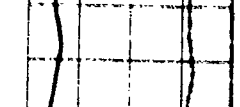
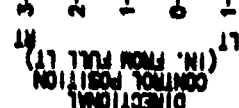
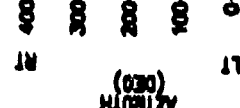
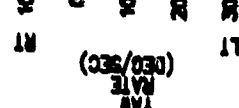
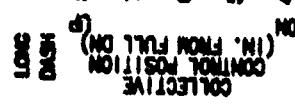
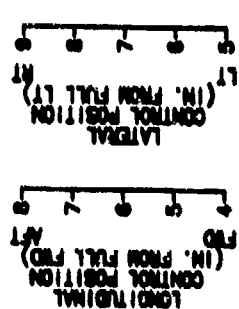
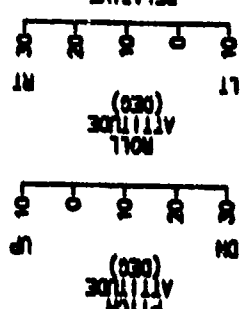
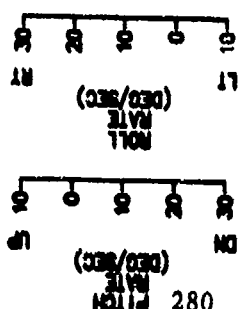
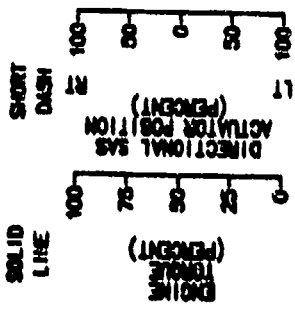


FIGURE E-245

LEFT ICE HOVER TURN

JOH-08C USA S/N 70-15348

WIND
SPEED
(KNOTS)
10 - 15

STABILITY
AUGMENTATION
SYSTEM
OFF

AVG
DENSITY
OAT
(DEG C)
17.0

AVG
ALTITUDE
(FEET)
2800

AVG CS
LOCATION
LAT (N)
0.1 LT

AVG
GROSS
WEIGHT
(LB)
2830

AVG CS
LONG
(FS)
108.2

AVG CS
LONG
(N)
0.1 LT

AVG CS
LONG
(N)
0.1 LT

AVG CS
LONG
(N)
0.1 LT

AVG CS
LONG
(N)
0.1 LT

AVG CS
LONG
(N)
0.1 LT

AVG CS
LONG
(N)
0.1 LT

AVG CS
LONG
(N)
0.1 LT

AVG CS
LONG
(N)
0.1 LT

AVG CS
LONG
(N)
0.1 LT

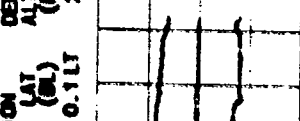
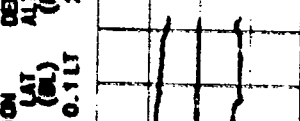
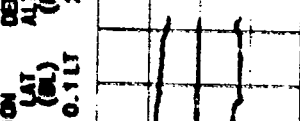
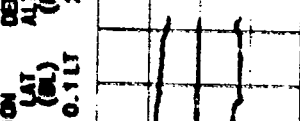
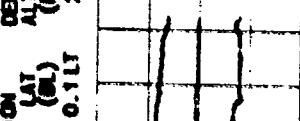
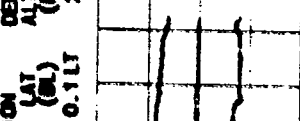
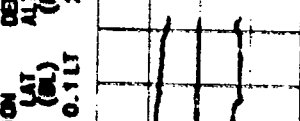
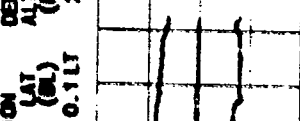
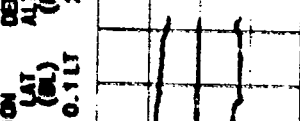
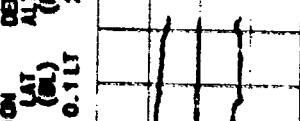
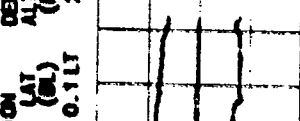
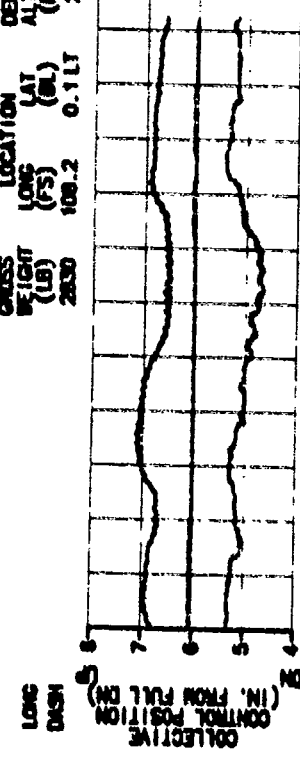
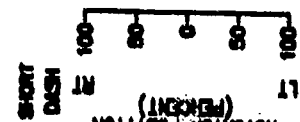
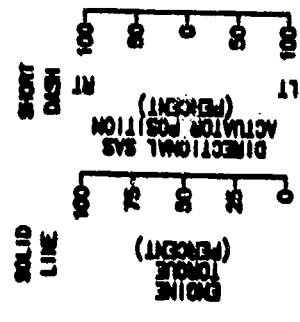


FIGURE E-246
RIGHT ICE HOVER TURN
JOH-50C USA S/N 70-15349

WIND SPEED (KNOTS)	STABILITY AUGMENTATION SYSTEM ON
10 - 15	

AVG PRESS EIGHT (LB)	AVG CB LOCATION	LONG (°S)	LAT (°N)
2830		108.2	0.1 LT

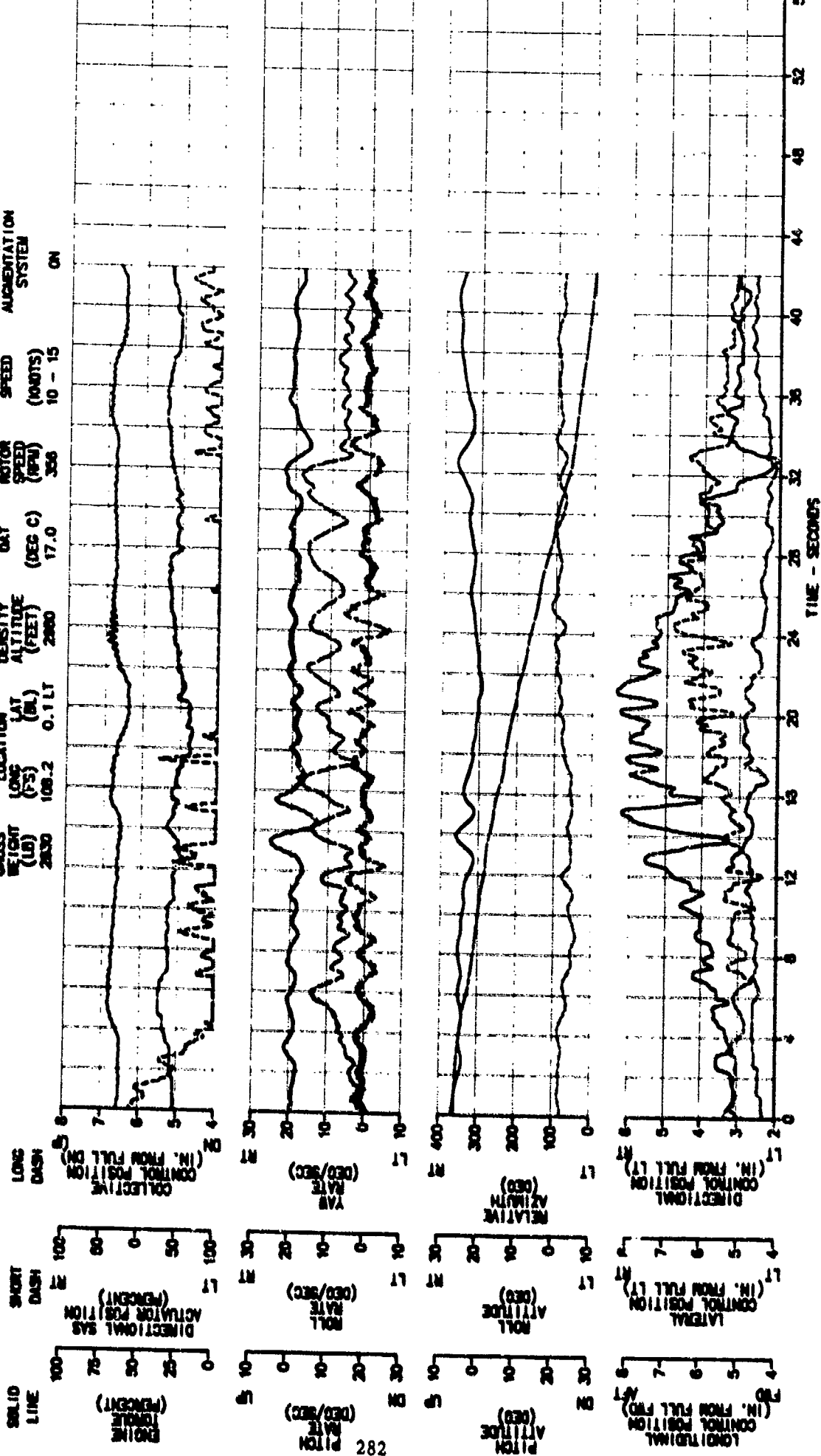
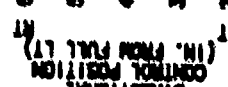
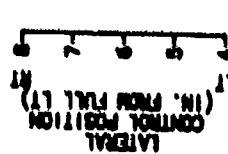
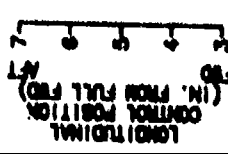
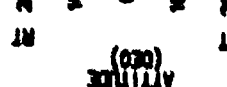
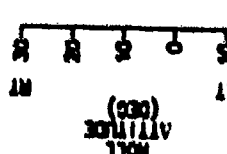
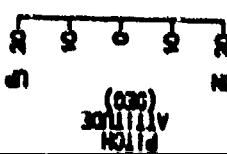
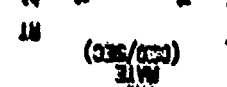
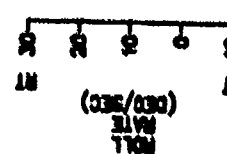
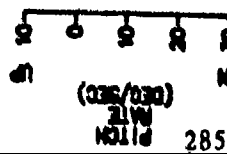
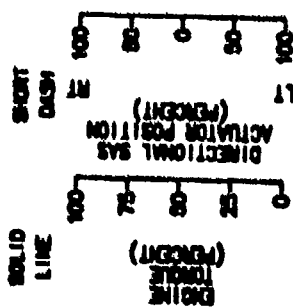


FIGURE E-249
QUICK STOP INTO THE WIND

JOM-50C USA S/N 70-15349
 AVG CROSS WEIGHT (LB) 2880
 AVG CS LOCATION LONG (°S) 108.3 LAT (°N) 0.0
 AVG ALTITUDE (FEET) 2780
 AVG OAT (DEG C) 13.5
 TRIM ROTOR SPEED (RPM) 350
 WIND SPEED (KNOTS) 23 - 36
 STABILITY AUGMENTATION SYSTEM ON



TIME - SECONDS

FIGURE E-250
QUICK STOP INTO THE WIND
J04-58C USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM

WIND
SPEED
(KNOTS)

TRIM
ROTOR
SPEED
(RPM)

AVG
CAT
(DEG C)

AVG
ALTITUDE
(FEET)

AVG CR
LOCATION
LONG (PS)

AVG CR
LOCATION
LAT (ML)

AVG
WEIGHT
(LB)

AVG
WEIGHT
(LB)

AVG
WEIGHT
(LB)

AVG
WEIGHT
(LB)

AVG
WEIGHT
(LB)

AVG
WEIGHT
(LB)

AVG
WEIGHT
(LB)

AVG
WEIGHT
(LB)

AVG
WEIGHT
(LB)

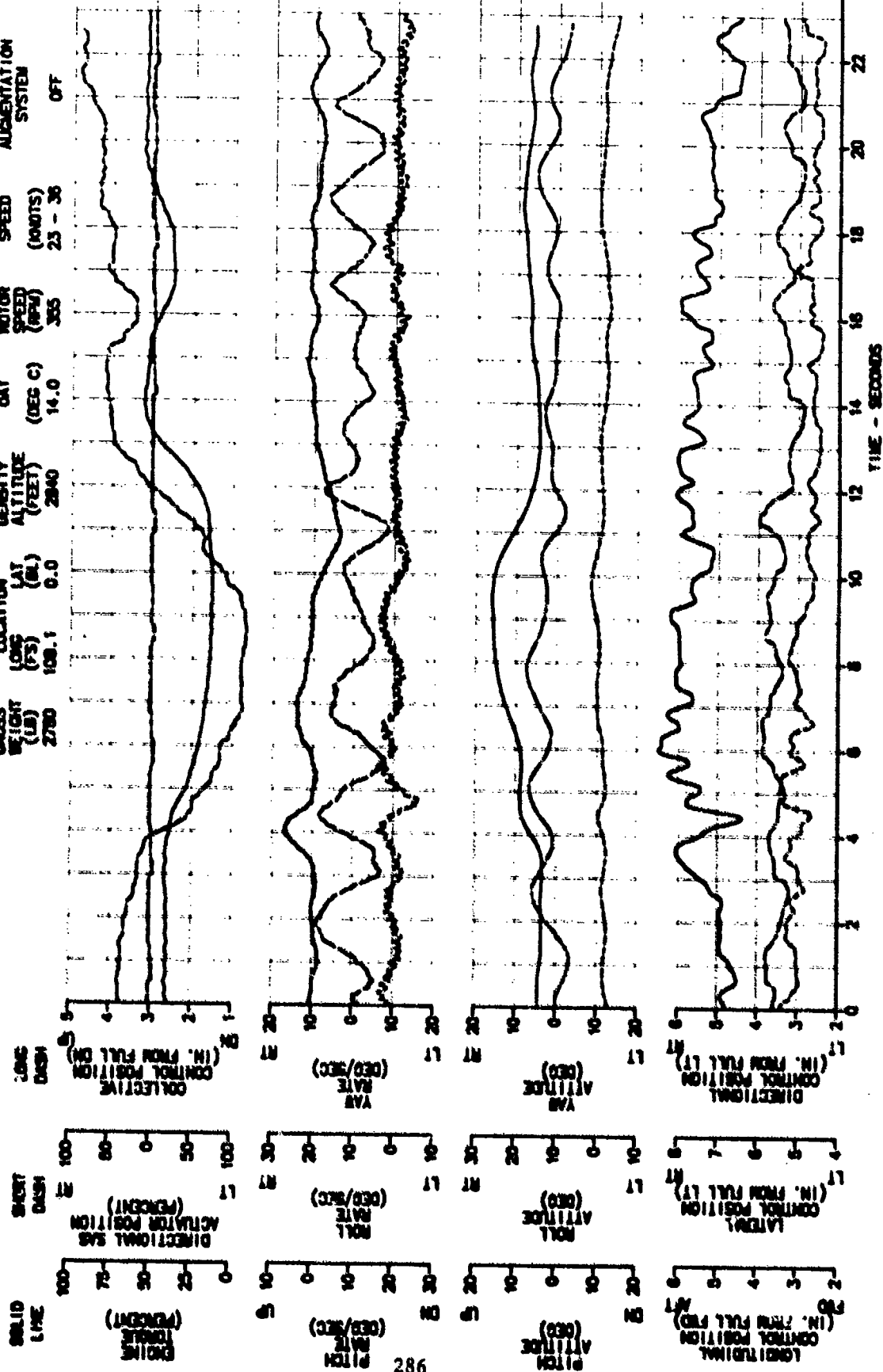


FIGURE E-251

TAKE OFF TO A HOVER

JOH-500 USA S/N 70-15349

STABILITY
Augmentation
System
ON

WIND
SPEED
(KNOTS)
25 - 30

AVG TRIM
DENSITY ALT
(DEG C) 14.5

AVG ALTITUDE
(FEET) 2000

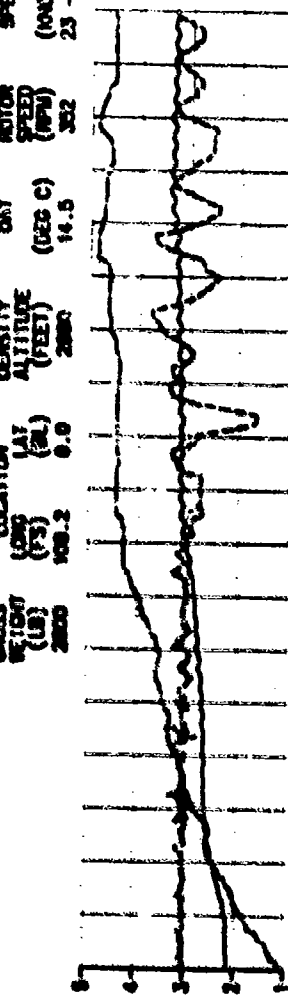
AVG CR
LOCATION
LAT (N) 0.0

AVG CR
WEIGHT
(LB) 2000

ENGINE
(PERCENT)
20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

DIRECTIONAL SAS
ACTION POSITION
(PERCENT)
20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

LONG
DASH
CONTROL POSITION
(IN. FROM FULL ON)



PITCH
RATE
(DEG/SEC)
20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

ROLL
RATE
(DEG/SEC)
20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

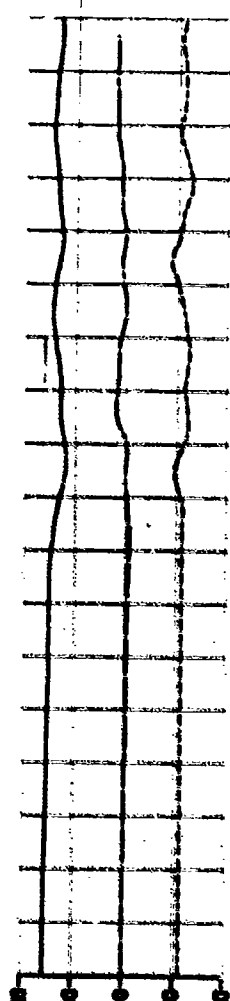
YAW
RATE
(DEG/SEC)
20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100



PITCH
ATTITUDE
(DEG)
20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

ROLL
ATTITUDE
(DEG)
20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

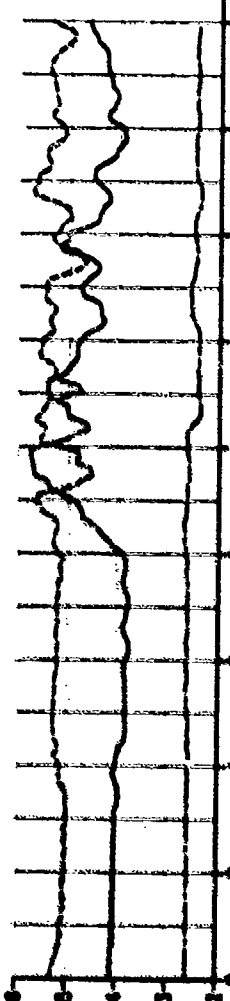
YAW
ATTITUDE
(DEG)
20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100



LONGITUDINAL
CONTROL POSITION
(IN. FROM FULL ON)

LATERAL
CONTROL POSITION
(IN. FROM FULL ON)

DIRECTIONAL
CONTROL POSITION
(IN. FROM FULL ON)



TIME - SECONDS

26

24

22

20

18

16

14

12

10

8

6

4

2

0

2

4

6

8

10

FIGURE E-252

TAKEOFF TO A HOVER

J04-00C USA S/N 70-15349

STABILITY
Augmentation
System
OFF

WIND
SPEED
(KNOTS)
25 - 36

TRIM
ROTOR
SPEED
(RPM)
253

AVG
DENSITY
ALTITUDE
(FEET)
2830

AVG OR
LOCATION
LONG (°S)
LAT (°N)
008.2 0.0

AVG
CROSS
WEIGHT
(LB)
2800

ENGINE
TORQUE
(PERCENT)

00

20

40

60

80

100

120

140

160

180

200

220

240

260

280

300

320

340

360

380

400

420

440

460

480

500

520

540

560

580

600

620

640

660

680

700

720

740

760

780

800

820

840

860

880

900

920

940

960

980

1000

1020

1040

1060

1080

1100

1120

1140

1160

1180

1200

1220

1240

1260

1280

1300

1320

1340

1360

1380

1400

1420

1440

1460

1480

1500

1520

1540

1560

1580

1600

1620

1640

1660

1680

1700

1720

1740

1760

1780

1800

1820

1840

1860

1880

1900

1920

1940

1960

1980

2000

2020

2040

2060

2080

2100

2120

2140

2160

2180

2200

2220

2240

2260

2280

2300

2320

2340

2360

2380

2400

2420

2440

2460

2480

2500

2520

2540

2560

2580

2600

2620

2640

2660

2680

2700

2720

2740

2760

2780

2800

2820

2840

2860

2880

2900

2920

2940

2960

2980

3000

3020

3040

3060

3080

3100

3120

3140

3160

3180

3200

3220

3240

3260

3280

3300

3320

3340

3360

3380

3400

3420

3440

3460

3480

3500

3520

3540

3560

3580

3600

3620

3640

3660

3680

3700

3720

3740

3760

3780

3800

3820

3840

3860

3880

3900

3920

3940

3960

3980

4000

4020

4040

4060

4080

4100

4120

4140

4160

4180

4200

4220

4240

4260

4280

4300

4320

4340

4360

4380

4400

4420

4440

4460

4480

4500

4520

4540

4560

4580

4600

4620

4640

4660

4680

4700

4720

4740

4760

4780

4800

4820

4840

4860

4880

4900

4920

4940

4960

4980

5000

5020

5040

5060

5080

5100

5120

5140

5160

5180

5200

5220

5240

5260

5280

5300

5320

5340

5360

5380

5400

5420

5440

5460

5480

5500

5520

5540

5560

5580

5600

5620

5640

5660

5680

5700

5720

5740

5760

5780

5800

5820

5840

5860

5880

5900

5920

5940

5960

5980

6000

6020

6040

6060

6080

6100

6120

6140

6160

6180

6200

6220

6240

6260

6280

6300

6320

6340

F 408E E-25J

LANDING FROM A HOVER

COM-SEC USA S/N 10-15349

WIND
SPEED
(KNOTS)
21 - 36

STABILITY
AUGMENTATION
SYSTEM
ON

TRIM
SPEED
(KNOTS)
355

DES C)
14.0

AVG CO
LOCATION
LAT
(N)
0.0

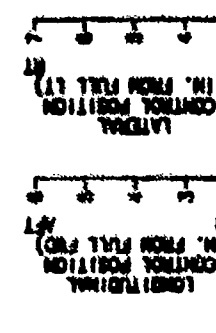
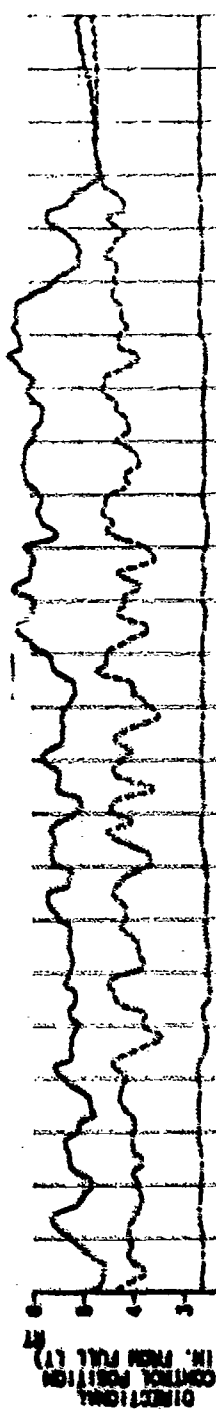
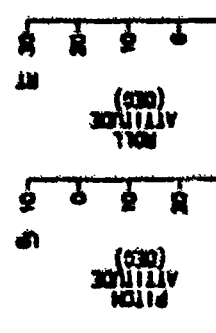
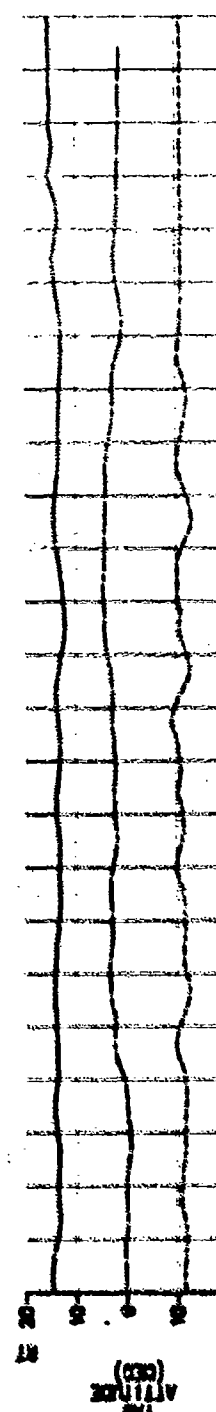
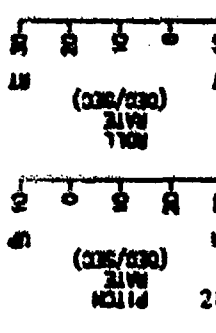
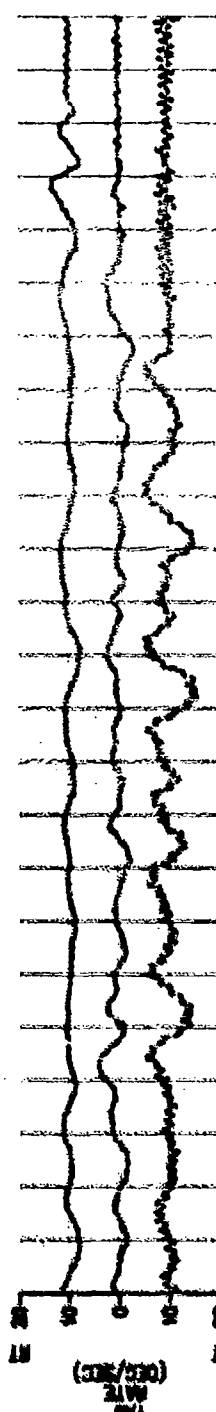
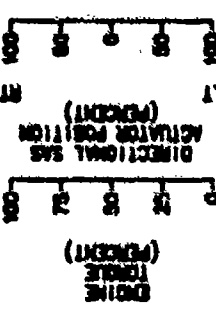
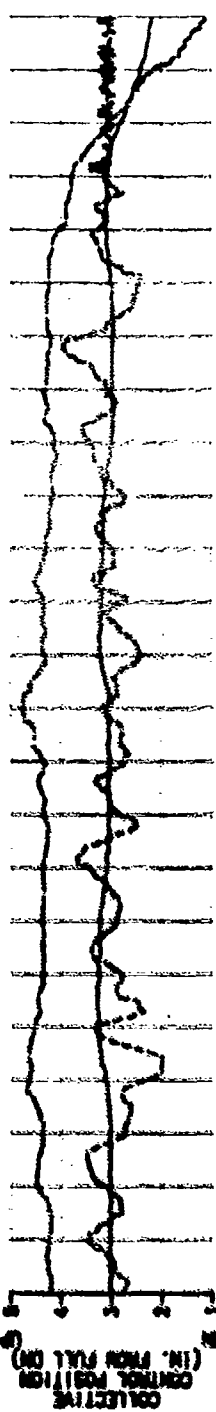
AVG
GROSS
WEIGHT
(LB)
2800

LONG
DASH
(IN. FROM FULL ON)

SHORT
DASH
(IN. FROM FULL LT)

ENGINE
TORQUE
(PERCENT)

ACTUATOR POSITION
(PERCENT)



TIME - SECONDS

FIGURE E-234

LANDING FROM A HOVER

JG-50C USA S/N 70-15349

STABILITY
AUGMENTATION
SYSTEM
OFF

RING
SPEED
(RPM)
23 - 36

TRIM
MOTOR
SPEED
(RPM)
354

AVG
DENSITY
ALTITUDE
(FEET)
2940

AVG
DENSITY
ALTITUDE
(FEET)
2940

AVG
DENSITY
ALTITUDE
(FEET)
2940

AVG
ORIGIN
WEIGHT
(LB)
2800

AVG
ORIGIN
WEIGHT
(LB)
2800

AVG
ORIGIN
WEIGHT
(LB)
2800

AVG
ORIGIN
WEIGHT
(LB)
2800

AVG
ORIGIN
WEIGHT
(LB)
2800

AVG
ORIGIN
WEIGHT
(LB)
2800

AVG
ORIGIN
WEIGHT
(LB)
2800

AVG
ORIGIN
WEIGHT
(LB)
2800

AVG
ORIGIN
WEIGHT
(LB)
2800

AVG
ORIGIN
WEIGHT
(LB)
2800

AVG
ORIGIN
WEIGHT
(LB)
2800

AVG
ORIGIN
WEIGHT
(LB)
2800

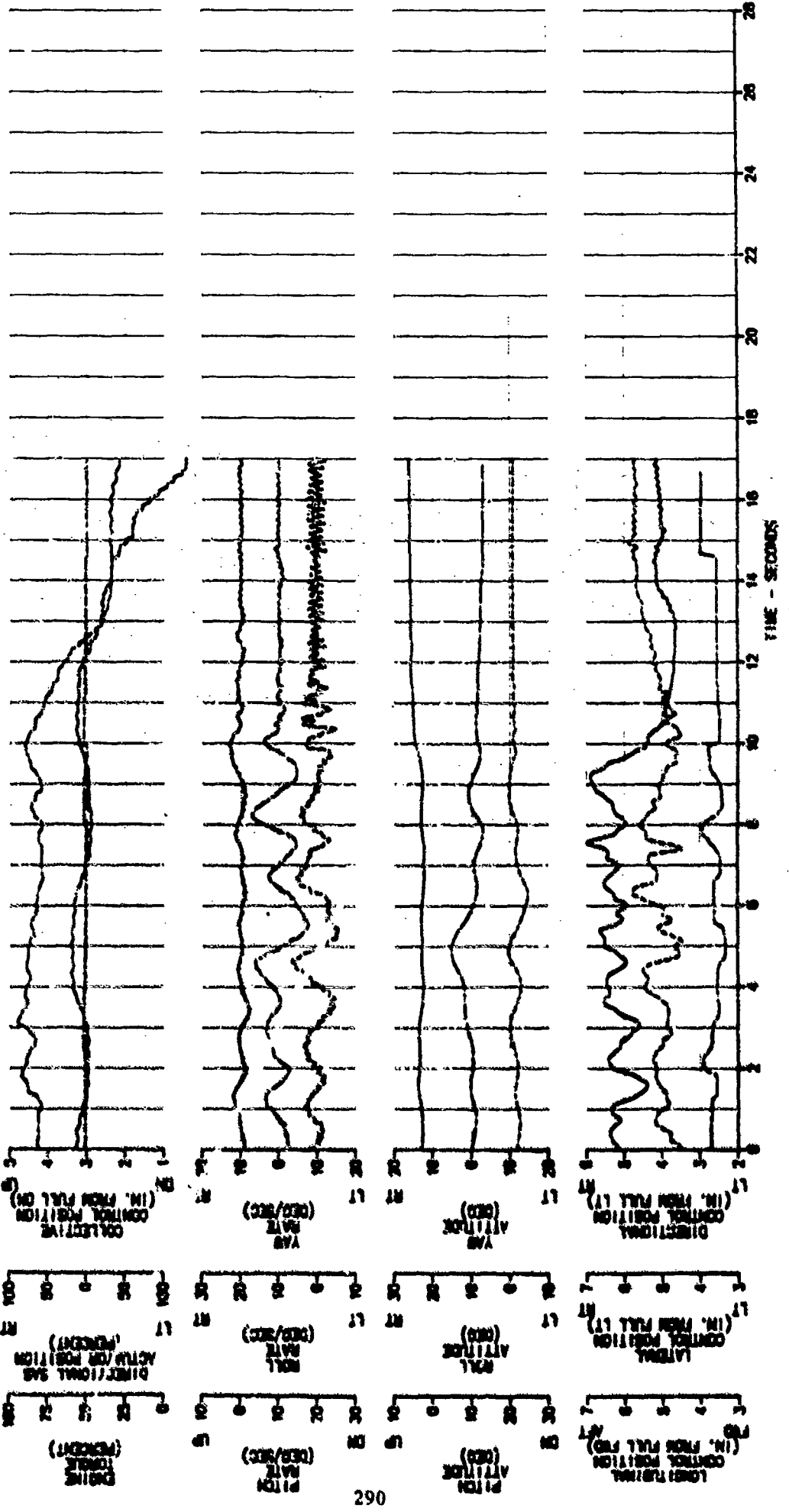
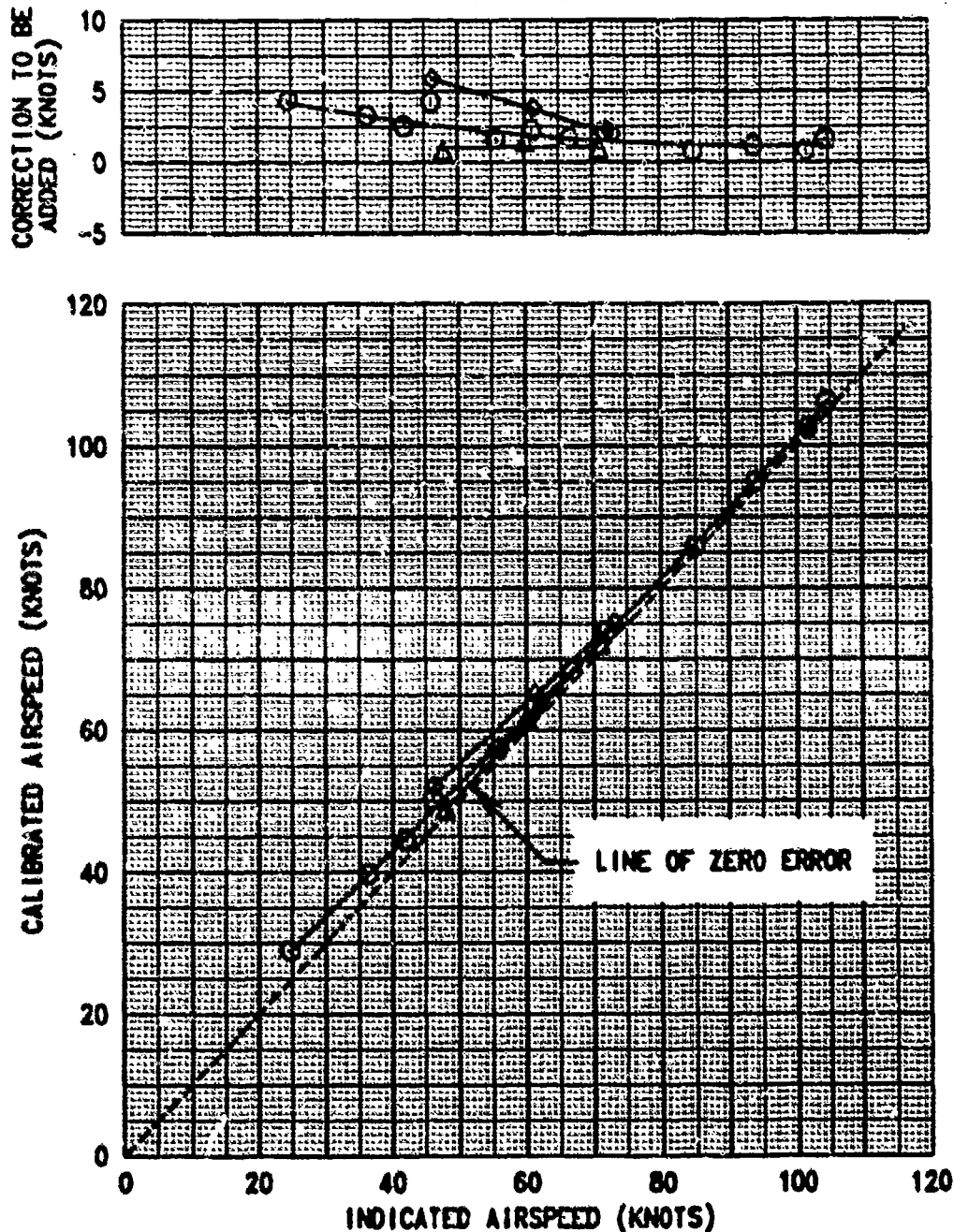


FIGURE E-255
SHIP SYSTEM AIRSPEED CALIBRATION
JOH-58C USA S/N 70-15349

SYM	AVG GROSS WEIGHT (LB)	AVG CG LOCATION LONG (FS)	AVG CG LOCATION LAT (BL)	AVG DENSITY ALTITUDE (FT)	AVG OAT (DEG C)	AVG ROTOR SPEED (RPM)	FLIGHT CONDITION
○	2940	108.1	0.0	6020	20.5	354	LEVEL
◇	2880	107.8	0.0	5980	20.5	354	CLIMB
△	2900	107.9	0.0	5920	20.5	354	AUTOROTATION

NOTES: 1. CONFIGURATION: CLEAN, DOORS ON
2. TRAILING BOMB METHOD



DISTRIBUTION

HQDA (DALO-AV)	1
HQDA (DALO-FDQ)	1
HQDA (DAMO-HRS)	1
HQDA (SARD-PPM-T)	1
HQDA (SARD-RA)	1
HQDA (SARD-WSA)	1
US Army Material Command (AMCDE-SA, AMCDE-P, AMCQA-SA, AMCQA-ST)	4
US Training and Doctrine Command (ATCD-T, ATCD-B)	2
US Army Aviation Systems Command (AMSAV-8, AMSAV-Q, AMSAV-MC, AMSAV-ME, AMSAV-L, AMSAV-N, AMSAV-GTD)	8
US Army Test and Evaluation Command (AMSTE-TE-V, AMSTE-TE-O)	2
US Army Logistics Evaluation Agency (DALO-LEI)	1
US Army Materiel Systems Analysis Agency (AMXSY-RV, AMXSY-MP)	8
US Army Operational Test and Evaluation Agency (CSTE-AVSD-E)	2
US Army Armor School (ATSB-CD-TE)	1
US Army Aviation Center (ATZQ-D-T, ATZQ-CDC-C, ATZQ-TSM-A, ATZQ-TSM-S, ATZQ-TSM-LH)	5
US Army Combined Arms Center (ATZL-TIE)	1
US Army Safety Center (PESC-SPA, PESC-SE)	2
US Army Cost and Economic Analysis Center (CACC-AM)	1
US Army Aviation Research and Technology Activity (AVSCOM)	3
NASA/Ames Research Center (SAVRT-R, SAVRT-M (Library))	

US Army Aviation Research and Technology Activity (AVSCOM)	2
Aviation Applied Technology Directorate (SAVRT-TY-DRD, SAVRT-TY-TSC (Tech Library)	
US Army Aviation Research and Technology Activity (AVSCOM)	1
Aeroflightdynamics Directorate (SAVRT-AF-D)	
US Army Aviation Research and Technology Activity (AVSCOM)	1
Propulsion Directorate (SAVRT-PN-D)	
Defense Technical Information Center (FDAC)	2
US Military Academy, Department of Mechanics (Aero Group Director)	1
ASD/AFXT, ASD/ENF	2
US Army Aviation Development Test Activity (STEBG-CT)	2
Assistant Technical Director for Projects, Code: CT-24 (Mr. Joseph Dunn)	2
6520 Test Group (ENML)	1
Commander, Naval Air Systems Command (AIR 5115B, AIR 5301)	3
Defense Intelligence Agency (DIA-DT-2D)	1
School of Aerospace Engineering (Dr. Daniel P. Schrage)	1
Headquarters United States Army Aviation Center and Fort Rucker (ATZQ-ESO-L)	1
Commander, US Army Aviation Systems Command (AMSAV-EA)	1
Commander, US Army Aviation Systems Command (AMSAV-EIO)	1
Commander, US Army Aviation Systems Command (AMSAV-LOH)	2